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“Thank God I’m Mexican”:

Cognitive Racial Reappraisal Strategies of Latino Engineering Students

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of the Philosophy in Education

by

Elvira Julia Abrica

2015

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## **ABSTRACT OF THE DISSERTATION**

“Thank God I’m Mexican”:

Cognitive Racial Reappraisal Strategies of Latino Engineering Students

by

Elvira Julia Abrica

Doctor of Philosophy in Education

University of California, Los Angeles 2015

Professor Patricia M. McDonough, Chair

Latinos are the nation’s largest and fastest growing population in the United States and are increasingly represented on college and university campuses. Despite the fact that Latinos pursue science, technology, engineering, and mathematics (STEM) degrees as often as their peers, Latino degree completion rates lag behind those of other demographic groups. In an effort to better understand Latino persistence in STEM, this qualitative dissertation study explored the noncognitive persistence strategies of Latino men pursuing engineering degrees at two highly selective, four-year institutions. While prior higher education research has established that noncognitive, or nonacademic, strategies are especially important for racialized minority students, there has been insufficient attention paid specifically to students’ understanding and responses to race and racism. This study explored Latino engineering students’ understanding and responses to race and racism, with attention to ways in which understanding and responses

differed by immigrant generation. A total of 37 semi-structured interviews were conducted and analyzed. Findings indicate that immigrant generation shaped levels of ethnic belonging and critique of racism in society. Responses to racism resembled the organizational behaviors of *bridging* and *buffering*, in that participants engaged with the environment to take advantage of available resources but managed to buffer themselves from negative elements of the environment (e. g. racial discrimination, stigmatization, stereotypes). Participants' bridging and buffering strategies counter the implication that Latino persistence strategies are devoid of cognitive processes and, thus, are herein referred to as *cognitive racial reappraisal persistence strategies*.

The dissertation of Elvira Julia Abrica is approved.

Vilma Ortiz

Christina A. Christie

Daniel G. Solorzano

Patricia M. McDonough, Ego o kwgg'Chair

University of California, Los Angeles  
2015

*For My Mother-*

*How magnificent you are.*

*You not only gave me life, but you dedicated your own to ensure my safety and every happiness. Your love, powerful as it is, insulates me from the harsh realities of the world and imbues me with profound and unyielding hope.*

*It is with great joy that I dedicate this work to you.*

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## VITA

Born, Apple Valley, California

- 2004 Undergraduate Research Fellowship Award  
University of California, Los Angeles (UCLA)
- 2005 Undergraduate Research Fellowship Award  
University of California, Los Angeles (UCLA)
- 2005 Dean's Prize for Excellence in Undergraduate Research, 7<sup>th</sup>  
Annual Westwind/Aleph Conference for undergraduate Research  
University of California, Los Angeles (UCLA)
- 2006 Outstanding Oral Presentation Award  
Committee on Institutional Cooperation (CIC)  
Summer Research Opportunities Program (SROP)  
University of Illinois at Urbana-Champaign (UIUC)
- 2007 Ronald E. McNair Scholar  
University of California, Los Angeles (UCLA)
- 2008 B. A. Chicana/o Studies, Education Studies Minor  
University of California, Los Angeles (UCLA)
- 2009 M. A. Higher Education and Organizational Change (HEOC)  
University of California, Los Angeles (UCLA)
- 2009-Present Research Analyst  
Student Affairs Information and Research Office (SAIRO)  
University of California, Los Angeles (UCLA)

## PUBLICATIONS AND PRESENTATIONS

Abrica, E. (2014, April). Family interdependence and STEM Success: The role of immigrant generation. Presentation at annual meeting of American Education Research Association (AERA), Philadelphia, PA.

Abrica, E., Teel, T. (2014, April). LGB aside and focusing on the T: A look at Transgender college students' experiences and perceptions of their learning environment. Presentation at annual meeting of American Education Research Association (AERA), Philadelphia, PA.

Abrica, E., Garnett, T., McKinney, K., (2014, March). Training staff for assessment in Student Affairs: Overview and lessons learned. Presentation at American College Personnel Association (ACPA) Convention, Indiana, IN

Abrica, E., Paulson, L., Teel, T., Htut-Rosales, A., McKinney, K. (2014, March). Change begins with staff: Reflections on intergroup dialogue facilitator training. Presentation at American College Personnel Association (ACPA) Convention, Indiana, IN.

Abrica, E., Yeung, F. P. (2011, May). Major choice and immigrant generation: Analysis and implications for social mobility. Presentation at annual meeting of American Education Research Association (AERA), New Orleans, LA.

Abrica, E. (2011, May). The Chicana and Chicano pipeline revisited ten years later: A critical race quantitative analysis of contemporary intersections. Presentation at annual meeting of American Education Research Association (AERA), New Orleans, LA.

Abrica, E. (2011, May). High school to military transitions: Critical analysis of militarization in shaping post-secondary opportunities. Presentation at annual meeting of American Education Research Association (AERA), New Orleans, LA.

Abrica, E. (2010, November). Co-ethnic support and the development of a transformational impetus: Later generation Mexican Americans in college. Presentation at annual meeting of Association for the Study of Higher Education (ASHE), Indianapolis, IN.

Alvarez, C., Gonzalez-Cardenas, E., Lara, E., Abrica, E. (2010, May). Querer es Poder: Using CRT to document Chicana/o educational experiences. Presentation at annual meeting of American Education Research Association (AERA), Denver, CO.

Abrica, E. (2010, May). The development of a transformational impetus. Presentation at annual meeting of American Education Research Association (AERA), Denver, CO.

Abrica, E. (2010, May). Junior Reserve Officer Training Corps. (JROTC) and the post-secondary decision-making process. Presentation at annual meeting of Critical Race Studies in Education Association (CRSEA), Salt Lake City, UT.

Barrera, D., Abrica, E., Alvarez, C., Arellano, L., Cuellar, M. (2009, November). Access and success for America's emerging majority: The individual, organizational, and institutional contexts of Latina/os in higher education. Presentation at annual meeting of Association for the Study of Higher Education (ASHE), Vancouver, BC.

McKinney, K., Abrica, E. (2012, March 19). *Promising practice: Involving students in assessment* Commission for Assessment and Evaluation (CAE) Newsletter. Retrieved from: <http://us1.campaignarchive2.com/u=13710155e50d9fb62d8454ef4&id=53724bc392&e=84a9dd1f3b>.

## CHAPTER 1: INTRODUCTION

As a nation, we are presented with a complex rhetorical landscape characterized simultaneously by an interest in increasing underrepresented racial minority (URM) student participation in science, technology, engineering, and mathematics (STEM) fields and the denial of the ongoing significance of race and racism. Disparities in STEM degree completion between Black, Latino, and Native American students and their White and Asian American counterparts are widely acknowledged, but there has been limited recognition of the ways in which a historical legacy of racial discrimination directly contributes to ongoing inequities in higher education. Despite increased attention to their experiences and outcomes, research has not fully explored the implications of *color* for *students of color* in STEM fields.

Disparities in enrollment and degree completion are often described as a threat to American economic growth and global competitiveness. Indeed, federal dollars are increasingly directed at interventions designed to promote racial minority participation and degree completion in STEM as a way to ensure our nation's technological innovation and scientific advancement. The desire to promote success for underrepresented racial minorities in STEM is framed as an issue of economic interest; however, the perpetual denial of access to STEM fields for historically underrepresented groups is also one of the most glaringly obvious social injustices we face today.

The current period of time may be described as one of *interest convergence* (Bell, 1979), in which advances for underrepresented racial minority groups are pursued only when such advances are in alignment with those in power. As Palmer and Wood (2013) explain, "students of color have largely been overlooked in STEM for decades, but now, have increasing importance in STEM conversations. Business leaders and policy makers have begun to realize

that the United States cannot continue to compete in a world marked by scientific and technological advancement without the incorporation of students of color into the STEM pipeline...the impetus for the recent national focus on students of color is purely motivated by national interests” (Palmer & Wood, 2013, p. xiv). However, they also concede that the current focus underrepresented racial minority students in STEM fields can be viewed as, “an opportunity to change systems, structures, programs, policies, and practices that have prevented the incorporation of historically underserved communities from entering into and succeeding in college (and particularly in STEM)” (Palmer & Wood, 2013, p. xiv).

In light of the current rhetorical climate surrounding racial minority students in STEM fields, this dissertation study centralizes students’ subjective understanding and responses to race and racism. The purpose is to identify how understanding and responses to race and racism may differ among Latino male engineering students, specifically by immigrant generation. A total of 37 semi-structured interviews were conducted with Latino male engineering students at two highly selective (one private and one public), four-year institutions in Southern California.

Rather than contribute to an ongoing discussion of the “plight” of URM students and how their inclusion in STEM can fuel economic prosperity, this study seeks to reframe the current discussion to one that considers how students understand and respond to race and racism, thrive in spite of their racialized status, and carve pathways for themselves and others within potentially oppressive institutional contexts. Ultimately, this dissertation is the story of a group of young men whose voices should be (but have not yet been) at the center of discussions about their persistence.

The purpose of this chapter is to provide background information and describe major aspects of the present dissertation study. The background section of this chapter is organized

into four major sections that include: 1) overview of URM persistence in STEM, 2) noncognitive dimensions of persistence in STEM for URM students, 3) understanding and responding to race and racism, and 4) the role of immigrant generation in shaping noncognitive dimensions of persistence. Ultimately, this chapter will highlight gaps in extant literature, namely, limitations around the treatment of race and racism that warrant further investigation.

## **Background**

### **I. Overview of Underrepresented Racial Minorities (URMs) in STEM**

Nationally, the number of students pursuing STEM fields is growing. For example, enrollment in STEM fields from 1995-1996 to 2003-2004 increased 21% (U. S. Government Accountability Office, 2005). The number of undergraduates pursuing STEM fields is likely to increase in light of increased federal spending to promote participation in these fields. The National Science foundation alone has awarded billions of dollars in federal funds to programs designed to encourage participation and persistence in STEM (National Science Foundation, 2015). As the number of students selecting STEM majors grows, higher education will continue to be challenged to retain historically underrepresented groups of women and racial minorities.

**Underrepresentation of URMs.** Disparities between URM, defined as American Indian or Alaska Native, Black, Hispanic or Latino, Native Hawaiian or other Pacific Islander groups, and non-URM students have been approached using inconsistent measures of degree completion and definitions of persistence. The problem of “underrepresentation” has been discussed as degree completion, student retention, student persistence, and STEM major choice, among other conceptualizations, according to a trend analysis conducted by American Institutes for Research (AIR, 2012). Each of these constructs has been measured differently (e.g. using raw numbers, percentage of total distribution, and performance comparisons), resulting in inconsistent findings

regarding outcomes for student sub-populations (AIR, 2012). For example, findings regarding the extent to which women are underrepresented in STEM, as compared to their male counterparts, have been contested (Espinosa, 2011; Kanny, Sax, & Riggers-Piehl, 2014; Ohland et al. , 2011).

Although research on URMs in STEM has yielded some inconsistent figures, there is consensus that URM students experience challenges before and during college, that shape both their participation and degree completion in STEM. Perhaps the most compelling data presented on the underrepresentation of URMs in STEM is that which compares URM population growth to their rates of degree completion. This kind of analysis demonstrates that population growth has not kept pace with degree completion rates. For example, URMs represented 29% of the total population in the United States in 2009 but they represented less than 14% of all STEM bachelor's degrees awarded in 2009 (Chen, 2009). Furthermore, it is particularly troubling that although African American and Latino students are just as likely to pursue STEM fields, their rates of degree completion rates are much lower (National Science Foundation, 2009; Higher Education Research Institute, 2010).

**Latinos in STEM.** Within the URM category, Latinos have become an increasingly popular group to study, due at least in part to the fact that Latinos are the nation's largest and fastest growing population (Krogstad & Lopez, 2014). Despite gains in post-secondary enrollment, Latinos remain underrepresented in four-year institutions and in STEM fields, specifically, as compared to their total population (Lopez & Fry, 2013). Furthermore, Latinos are significantly less likely than White students to earn a degree in STEM (Young, 2005). In 2004, for example, 16% of Latinos who began college as a STEM major completed a degree by 2009, as compared to 25% of White students (Higher Education Research Institute, 2010).



**Latinos in engineering.** Engineering is the second most popular major in STEM for Latinos, and based on demographic information and trends in STEM enrollments, Latino enrollment in engineering is predicted to increase dramatically (Ohland et al., 2011). Although the number of Latino students pursuing engineering degrees continues to increase, there exist significant educational disparities in both participation and degree completion between Latinos and other groups (Chapa & De La Rosa, 2006). For example, in 2014 Latinos represented only 6.3% of the engineering workforce, 8.6% of the engineering bachelor's degree recipients, and less than 4% of engineering faculty (NACME, 2014). Inequities observed in engineering are even more pronounced as Latino students pursue master's and doctoral degrees (Chapa & De La Rosa, 2006; Solórzano, 1995).

**Academic preparation.** Latinos face a host of negative schooling conditions that threaten their persistence in STEM fields. Chief among such conditions is inadequate academic preparation as a result of being concentrated in ineffective K-12 schools that do not provide access to quality math and science curriculum (NRC, 2011; Solórzano & Ornelas, 2004; Taningco, Mathew, & Pachon, 2008). For example, novice math and science teachers with three or less years of teaching experience are more frequently located in schools with high concentrations of racial minority students than in schools with fewer racial minority students (Aud, Fox, & Kewal Ramani, 2010; Banilower et al., 2013). Furthermore, Latino students are less likely than any other group (White, Black, and Asian/Pacific Islander) to earn advanced math and science credits in high school (NACME, 2014). Limited access to rigorous math and science curriculum has been identified as a primary threat to persistence in STEM fields (Adelman, 2006; Anderson & Kim, 2006; Bonous-Hammarth, 2000).

Some scholars emphasize that Latino underrepresentation in engineering reflects a problem of recruitment rather than retention (Camacho & Lord, 2011, 2013; Lord et al., 2009) and posit that Latinas and Latinos persist in engineering at the same rates as their White peers (Lord et al., 2009). Other research, including a study by UCLA's Higher Education Research Institute (2010), has assessed differences by race/ethnicity in the number of students who initially select a STEM major and graduate four or five years later. Whatever the emphasis, research consistently demonstrates a need to increase both rates of participation and degree completion for Latino students, especially because of the rate at which this particular population is projected to grow in coming years.

**Gender differences for Latinos in engineering.** Camacho and Lord (2013) posit that the perceived gender gap between Latina and Latino engineering students is over exaggerated and that Latinas persist at the same rates as their male counterparts. Similarly, Cole and Espinoza (2008), in their study of 146 Latino students, found that Latinas were more likely to earn higher grade point averages than their male counterparts and demonstrated greater levels of academic preparedness. This is consistent with other studies that have found that women are more academically prepared and have higher rates of degree completion than men (Lord, Layton, & Ohland, 2011; Ohland et al., 2011). For example, Ohland et al. (2011) posit that gender differences observed for Latinos, as well as for Asian, Black, Native American, and White students, are outweighed by institutional differences (e.g. differences in outcomes observed for Hispanic Serving Institution, Historically Black Colleges and Universities, and Predominantly White Institutions).

On the other hand, research on Latinas in engineering and other STEM fields consistently finds that women must confront additional barriers to establish a sense of belonging in these

male-dominated fields (Espinosa, 2011). The experiences and outcomes of women of color in STEM are undeniably in need of ongoing attention in order to meaningfully address historical exclusion of this population. However, in light of research that suggests that racial differences in STEM success are greater than those differences observed by gender (Ohland et al. , 2011), it may be most fruitful to consider how various racialized sub-populations deal with (i.e. understand and respond) to race and racism in order to successfully complete their degrees. Furthermore, Latino men, and men of color more broadly, are effectively “vanishing” from higher education (Saenz & Ponjuan, 2009, 2011), which warrants consideration of their unique experiences. Ultimately, it is paramount that we explore persistence in STEM for all historically underrepresented groups including racial minorities, women, and low-income students (Espinosa, 2011; Ong, Wright, Espinosa, & Orfield, 2011), but it may be particularly timely to pursue the specific ways in which women and men’s persistence is uniquely shaped by their understanding and responses to race and racism.

## **II. Noncognitive Dimensions of Persistence in STEM**

A large and growing body of work has documented that academic factors (e.g. number of Advanced Placement courses taken in high school, preparation in math and science, grade point average, etc. ) may not be as important in shaping URM persistence (both inside and outside of STEM) as their interactions with others and experiences in the college environment. Indeed, there is growing recognition that nonacademic (social, cultural, and psychological) factors play an important role in persistence for racial minority students. While all students may experience nonacademic challenges, there is evidence to suggest that racial minority student experiences and outcomes are uniquely shaped by consequences associated with a racially minoritized status (along with other forms of oppression that may intersect with racial oppression). Numerous

studies support the conclusion that college student persistence looks very different for students of color than it does for White students, both inside and outside of STEM fields. This section will describe the noncognitive dimensions that positively shape persistence for URM students.

**Campus Racial Climate.** Campus racial climate has been identified as an important framework for understanding the dimensions of a positive learning environment (Harper & Hurtado, 2007; Hurtado, 1992; Solorzano et al. , 2000). It identifies four distinct but interrelated dimensions of campus climate, including structural diversity (extent to which the student body, faculty, and administration are diverse); historical legacy of inclusion/exclusion (institutionalized racism); psychological dimensions (attitudes and beliefs about diversity); and behavioral interactions (social interactions between individuals from different racial/ethnic backgrounds) (Hurtado, Dey, Gurin, & Gurin, 2003; Milem, Clayton-Pedersen, Hurtado, & Allen, 1998). Unfortunately, the experiences of students of color across these dimensions are often more negative than positive, particularly at highly selective four-year institutions.

A lack of structural diversity, in particular, has been linked to a host of negative outcomes for students of color, including experiences with racial isolation and discrimination (Allen, 1992; Solórzano, Ceja, & Yosso, 2000). Such negative experience threaten persistence for URM students (Hurtado, Newman, Tran, & Chang, 2010; Hurtado & Ponjuan, 2005). Furthermore, limited structural diversity, or opportunities to positively engage with diverse peers, means that all students miss out on the chance to build cultural-competencies such as the development of cultural knowledge, greater awareness of social problems, and openness to diversity (Chang, Astin, & Kim, 2004; Chang, Denson, Saenz, & Misa, 2006). Within the context of STEM fields, limited opportunities for positive engagement with peers fosters a negative and highly competitive environment that serves to challenge the persistence of all students and compounds the challenges posed by an already challenging learning environment (Chang, Cerna, Han, & Saenz, 2008).

**STEM Climate.** A major problem across institutions is that STEM classroom environments are too often characterized by poor teaching quality, overreliance on teaching assistants, and a highly competitive peer environment, particularly in first year courses, where students are “weeded out” from the discipline (Chang et al. , 2008; Hurtado, Cabrera, Lin, Arellano, & Espinosa, 2009; Seymour & Hewitt, 1997). Highly selective institutions foster a competitive STEM environment in which students, regardless of their racial background or level of academic preparation, are at risk of departure (Chang et al., 2008). However, there is also evidence to suggest that the high status associated with attending a highly selective institution may lend itself to positive attitudes and perceptions among URM students, which ultimately may positively shape persistence (Chang et al., 2008). Ultimately, the competitiveness of STEM fields drives the selectivity of institutions, which by design, serves to exclude students who are unable to compete. It is important to consider the ways in which Latinos successfully compete within these contexts that are inherently designed, culturally (by virtue of the prevalence of a scientific culture described in subsequent sections) and structurally (as reflected in limited structural diversity), to fail.

**STEM Culture and Science Identity.** In addition to the campus racial climate and competitive classroom environments that STEM students typically face, a “culture of science” can also challenge students’ persistence in these fields. Specifically, positivistic attitudes about the nature of reality and facts, as well as the behaviors associated with being a “good scientist” do not necessarily promote a positive learning environment for students (Hurtado et al. , 2009; Seymour & Hewitt, 1997). Further, individuals must conform to the standards and behaviors associated with “doing science” (e. g. upholding the scientific method) or risk being viewed as nonconforming or nonscientific (Hurtado et al. , 2009). While limited research has explored

individual cultures and climates of STEM fields separately, it is likely that engineering and its various sub-disciplines are characterized by a highly competitive, positivist, and conformist characteristics.

In addition to adhering to the principles of a “scientific culture,” STEM classrooms appear limited in their ability to convey a relevance of the curriculum to society or improving the lives of members of communities of color (Bonous-Hammarth, 2000). Inherently, curriculum is structured in a way that does not allow for the exploration of connections between course material and social justice (Garibay, 2015). Indeed, individual advancement is prioritized over issues of social justice and engagement with a diverse society (Garibay, 2015). Ultimately, the nature of STEM disciplines is such that students are encouraged to compete with one another rather than support one another, and there is limited opportunity for engagement with diverse peers or with diverse perspectives, issues, and people in society at large. Such characteristics may be isolating for racial minority students and result in a negative classroom experience. Elements of a negative classroom environment can serve to disrupt students’ path to degree completion (Eagan, Hurtado, & Chang, 2010; Espinosa, 2011; Seymour & Hewitt, 1997).

**Racial Stigma and Stereotypes.** Beyond the scientific culture that pervades STEM fields, URMs must confront a learning environment in which they experience racial stigma and negative racial stereotypes. URMs often experience being the only person of color in their classes or more direct encounters with racial discrimination that may lead them to internalize negative beliefs about themselves, the racialized group to which they belong, and/or question their academic abilities. Such experiences are well documented in higher education literature, more broadly, as well as in literature on the experience of URMs in STEM fields. For example, a study by Chang and colleagues (2011) explored whether or not a high frequency of negative

racial interactions and a high degree of identification with the field of study would result place URM students at risk of switching out of biomedical and behavioral science majors. They found that those students who most highly identified with their field of study (science) were most vulnerable to departure from these fields, most vulnerable to the threat of stereotypes (Chang, Eagan, Lin, & Hurtado, 2011). These findings suggest that those who care deeply about their field of study are more likely to leave such fields when faced with negative racial experiences.

A number of other studies of URM experiences and outcomes in STEM have utilized the concept of stereotype threat (Steele, 1997; Steele & Aronson, 1995), as it has gained traction in the field of higher education. The basic premise of stereotype threat is that racialized individuals may understand that their performance in a given situation may be interpreted as a reflection of their racial group. When an individual cares deeply about their performance, and believes it will be interpreted as confirming evidence for negative stereotypes, there can be negative consequences for their academic performance. The utility of the concept of stereotype threat is demonstrated by its application to so many studies that find that URM students often experience negative stereotypes about their abilities (particularly in math and science), and that these stereotypes threaten academic performance and persistence. Research on racial stereotypes and stigma has established, again and again, that URM students are racialized. There remains work to be done to explore how students respond to this racialization, how they understand it, and inter and intra group differences in students' understanding and responses to race and racism.

**Institutional characteristics.** Other institutional factors that can influence persistence of URM students include inadequate availability of financial aid (Hurtado et al. , 2010; James & Carlson, 2012; Malcom & Dowd, 2012), institutional selectivity (Chang et al. , 2008), type (Crisp, Nora, & Taggart, 2009) and size of an institution (Museus & Liverman, 2010). Again,

research on institutional selectivity indicates that highly competitive STEM environments can threaten persistence of all students, particularly those who are highly motivated and highly identified with their field of study (Chang et al., 2011). Factors that hinder degree completion in STEM fields have been well documented in a literature that has proliferated over the past 40 years, particularly in studies of historically underrepresented groups (Kanny et al. , 2014).

Although studies on noncognitive dimensions of persistence typically focus on the factors that challenge student persistence in STEM fields, research has also identified experiences and interactions in college that can positively shape persistence. For example, several studies of URM persistence have found that support from peers can positively influence persistence. Harper's (2010) study of Black male achievers, for example, found that students relied heavily on peer support in the context of professional engineering organizations.

**Interactions with peers.** More broadly, other researchers have found that peers of the same racial/ethnic background provide a source of academic, emotional, and social support, particularly in the context of a negative campus racial climate (Harper & Quaye, 2007) . Positive interaction with same-race peers can play a particularly important role in persistence for Latino students (Gloria, Castellanos, Lopez, & Rosales, 2005; Hernandez, 2000; Hernandez & Lopez, 2004; Yosso, 2005, 2006). Latinos and other students of color respond to racial discrimination through the creation of counterpaces in which “deficit notions of people of color can be challenged and where a positive collegiate racial climate can be established and maintained” (Solórzano et al., 2000, p. 70). Despite the clear finding that peers can play an important part in persistence of URMs, inside and outside of STEM, there is comparatively less information available about the conditions needed for this kind of peer support or whether intragroup differences shape the nature of peer support



**Self-concept.** Other factors that determine whether students will persist in STEM include student attributes such as their self-concept (Chang et al., 2010). Positive self-concept refers to the extent to which students hold positive views of themselves, which is decidedly related to sense of belonging at predominately White institutions (Tracey & Sedlacek, 1984). Self-concept has been linked to the distinct racial/ethnic identity developmental processes undergone by students of color. Since part of building a positive self-concept for students of color involves having to adapt to predominantly White environments, self-concept may worsen or improve as students undergo various stages of racial identity development (Parham & Helms, 1985; Sedlacek, 1999).

**Summary of noncognitive factors in persistence.** This section has described key factors that shape persistence. In addition to the aforementioned individual characteristics, dimensions of classroom and campus climate, and peer interactions, there are a number of other noncognitive factors that may shape persistence for URM students. For example, seeking out supportive faculty and undergraduate research involvement are other strategies that promote Latino persistence in STEM (Fries-Britt, Younger, & Hall, 2010; Griffin, Pérez, Holmes, & Mayo, 2010).

**A focus on success.** A major trend in literature on URMs in STEM is that there has been far more attention paid to the noncognitive factors that threaten persistence in STEM than the factors that promote it. There are students who manage to persist toward degree completion, despite the aforementioned challenges, but the stories of these students are often not told (Hurtado et al. , 2009). Indeed, the ways in which students successfully navigate STEM fields in highly selective, four-year institutions that may be racially hostile have gone underexplored (Hurtado et al. , 2009; Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005). As Harper (2010)

points out, asking over and over the same question of why URMs are underrepresented in STEM fields may serve to “amplify minority student failure and deficits instead of achievements.” As a consequence of asking the same questions, “we know little about those students who, despite all that we know about what complicates and undermines achievement for their particular racial groups, manage to successfully navigate their ways to college and through the STEM postsecondary pipeline” (Harper, 2010, p. 64). More specifically, we know little about how students understand and respond to race and racism in the context of STEM fields.

### **Section III. Understanding and Responding to Race and Racism**

As the previous section demonstrated, researchers have identified a host of noncognitive dimensions that promote persistence. Others include other factors such as realistic self-appraisal, understanding and ability to deal with racism, preference for long-range goals over short-term goals, support of others, successful leadership experience, demonstrated community service, and demonstrated knowledge in a non-traditional field (Tracey & Sedlacek, 1984, 1985, 1987a, 1987b). “Understanding and ability to deal with racism,” as a noncognitive factor in persistence, has been identified specifically as more important than prior academic achievement in predicting persistence for African American students (Tracey & Sedlacek, 1984, 1985, 1987a, 1987b). This is not true for White students, for whom academic achievement is a strong predictor of success in college. Subsequent studies of various sociocultural and contextual dimensions of persistence have consistently found differences in experiences and outcomes between White and non-White students (Dennis, Phinney, & Chuateco, 2005; Smedley, Myers, & Harrel, 1993; Solórzano et al., 2000).

It is interesting to note the limited extent to which studies have directly focused on understanding and responding to racism as a noncognitive dimension of persistence. Instead,

literature seems to focus more broadly on perceptions of discrimination. For example, Nora & Cabrera (1996) conceptualized perceptions of discrimination in terms of how frequently students had been the victims of prejudice or discrimination. Eimers and Pike (1997) utilized this construct in their comparison of minority (Latino, African American, Asian American, and Native American) and non-minority (White) students. Other studies have focused on macro-level dimensions of institutional contexts that shape persistence such as experiences with the campus environment (e.g. experiences with racial microaggressions, perceptions of campus climate) or individual stages of racial and ethnic identity development. Arguably, such foci are fundamentally different from students' subjective *understanding* and *responses* to racism. While such studies are significant in providing information about the campus racial climate, they do not offer a description of students' subjective understanding of how students may think about and respond to race and racism.

Moreover, racial minority students have been compared to White students in studies of experiences and perceptions of racial discrimination, which implies that all students of color experience racism in the same ways and that White students' racial privilege can be suspended enough to even compare their racialized experiences to non-White students. Though there is information available on noncognitive persistence strategies, we know little about the specific strategies related to how students understand and respond to racism or how understanding and responses may differ by student sub-populations.

**What do we know about how students respond to race and racism?** Higher education literature on students of color, primarily outside the realm of STEM fields, has documented that students respond in complex ways to race and racism. For example, we know that students' responses to racialized minority status include coalition building, community

building, and social justice engagement and activism (Maldonado, Rhoads, & Buenavista, 2005). Terms such as activism, empowerment, resistance, resistant cultural capital, and coping have been applied in studies of how students' individual responses to race and racism. These terms have been derived from various disciplines and theoretical traditions. Although racialization is well documented in STEM fields, there has been comparatively less attention paid to documenting response to racialization in STEM. What follows is a description of some of two themes that emerge from the literature on how students of color experience, and sometimes respond to, race and racism in STEM.

**“Prove them wrong” attitude/ race as motivation.** Extant research has found that negative racial experiences, exposure to racial stereotypes, and marginalization sometimes provide students the impetus to succeed educationally. Fries-Britt and colleagues (Fries-Britt & Turner, 2002; Fries-Britt, Younger, & Hall, 2010) have described the never-ending “proving process” as one in which students of color perpetually must prove their academic ability or prove the negative perceptions others hold of them are untrue. This experience seems to be common to many students of color (Harper, 2010). While burdensome, this desire to prove one's intellectual abilities as well as other negative experiences has been found to be a motivation for students to succeed. It is unclear under what conditions students are able to transform negative experiences into a source of motivation.

**Stereotype Management.** Another study by McGee and Martin (2011), drawing on interviews with 23 Black mathematics and engineering students, suggests the need to focus on how students *respond and manage* stereotypes. They offer the concept of stereotype management as a new direction for stereotype threat literature. Their emphasis is on stereotype management as an alternative to stereotype threat, which they argue, fails to acknowledge the

everyday racial microaggressions inside and outside the classroom that shape students experiences beyond the manufactured test-taking situation. They posit that stereotype does not inherently lead to academic disengagement but can result in additional motivation for high achievement. Moreover, they argue that a fundamental difference between stereotype threat and their concept of stereotype management is that the former holds that stereotypes have to be primed while the latter suggests that the stereotype threat is omnipresent. While these are certainly limitations of stereotype threat research, the authors seem to present stereotype management and stereotype threat as opposing constructs. It may be more appropriate to frame stereotype management as an *extension* of stereotype threat literature. Responses to stereotypes have been comparatively understudied as compared to work focusing on African American students.

While literature on race and racism in the STEM context does exist, there remains much to be learned about students' specific understanding and responses to race and racism. We know little about how students succeed in spite of and, perhaps, because of negative experiences with being racialized. There has been limited focus on student responses to race and racism for Latino men (as a specific student population) in engineering (as a specific STEM field). Further, we know virtually nothing about how student responses to race and racism may differ by immigrant generation. As the subsequent section will demonstrate, immigrant generation is an important background characteristic that has important consequences for educational experiences and outcomes.

#### **IV. The Potential Role of Immigrant Generation in Shaping Understanding and Responses to Race and Racism**

Historically, Latinos have faced persistent educational inequities including but not limited to: residential segregation, low levels of academic achievement on standardized tests,

limited access to quality curriculum (including Advanced Placement courses), tracking, into vocational or remedial programs, overrepresentation in special education, low teacher expectations, and lack of role models, all of which may threaten college access and persistence (Kurlaender, 2006; McDonough, 1997; Oakes, 1985; Valencia, 2004). These factors have all contributed to a decline in educational attainment for the Mexican-American population, specifically. Indeed, whereas ideas about assimilation would suggest increases in educational attainment, the Mexican-American population has experienced downward assimilation in which third and fourth generation Mexican-Americans achieve less educationally than their first and second-generation counterparts (Telles & Ortiz, 2008). This has resulted in Mexican-Americans having the lowest educational levels among all Latinos and all other ethnic groups in the United States. Thus, Latinos are a large and rapidly demographic group that has yet to experience neither equitable educational outcomes nor the recognition of their prolonged participation in the elusive fight for social justice and inclusion.

Unfortunately, what we know of Latino student persistence in higher education is based almost exclusively on the experiences of 2<sup>nd</sup> generation (children of immigrants). This is perhaps not surprising given that the trend has been for recent immigrant students to outnumber later generation Latinos (Hernandez & Lopez, 2004). For example, a report published by UC Berkeley's Center for Studies in Higher Education found that among all University of California campuses, 54% of students reported having at least one immigrant parent. At Berkeley's campus, that percentage was 63%, earning it the title of an "Immigrant University" (Douglass, Roebken, & Thomas, 2007).

Still, there is a lingering absence of information about how having a recent or more distant immigrant experience may potentially shape experiences and outcomes. This may well

be an overlooked factor in persistence that could potentially provide important information about student persistence (Hao & Pong, 2008). Research on the role of immigrant generation is noticeably absent from higher education literature, yet, it has been identified as an important factor in education more broadly.

Currently, Latinos are experiencing a demographic shift in which the rate of foreign-born Latinos entering the U. S. is slowing and the number of native U. S. Latino births are growing (Pew Research Center, 2014). This shift can be explained by increased barriers to immigration, particularly along the U. S. - Mexico border. The Pew Research Center (2014) indicates that 800,000 U. S. -born Hispanics enter adulthood every year and that this figure will continue to rise. It will be of utmost importance to ensure this population has the opportunity to pursue post-secondary education that will afford opportunities to pursue careers in STEM fields.

**Immigrant educational advantage.** A close proximity to immigration may provide educational advantages to children of immigrants. It is presumed that immigrant children possess unique cultural resources that allow them to outperform native-born peers. In an effort to understand the educational success of the second generation, researchers have emphasized the role of cultural resources of immigrant families and strength of co-ethnic communities in academic success (Kao & Tienda, 2005). Research indicates that an authoritarian parenting style along with the presence of “significant others” play an important role in supporting and encouraging children of immigrants to succeed. Children of immigrants also tend to exhibit traditional forms of cultural capital or the attitudes and/or behaviors associated with a middle class lifestyle (e.g. positive attitude toward schooling, believing in the “system”). The second generation also has been described as being able to cling to a cultural narrative or a story of an honorable past which helps them to believe in their future success. Lastly, family dynamics like

gender and birth order also played a role in shaping the exceptional outcomes observed in the second generation (Fernandez-Kelly, 2008; Portes & Fernandez-Kelly, 2008; Portes & Rumbaut, 2001). Thus, while immigrants and their families may endure undeniable hardships in their journey toward a better life in the United States, sociologists have found that there are some positive aspects of immigration that promote educational success among the children of immigrants by providing them cultural resources valued in an American schooling context (Fernandez-Kelly, 2008; Harris, Jamison, & Trujillo, 2008)

**Attitudes toward schooling and perceptions of mobility.** An important way in which immigrant generation shapes experiences and outcomes in education is through individual attitudes toward schooling and perceptions of upward mobility. Indeed, extant literature reveals that recent immigrants to the United States tend to hold more optimistic beliefs about schooling and opportunities for social advancement, which in turn shapes their school performance. For example, Ogbu (1978) identified early on a difference between what he called “Voluntary” and “Involuntary” minority groups. Voluntary minorities, Ogbu asserted, are more recent immigrants who believe that through assimilation and hard work, differences between themselves and other Americans can be overcome and eventually lead to upward social mobility. Involuntary minorities, on the other hand, are defined as individuals who did not enter the United States geographically or politically on a voluntary basis and thus hold more negative views of the U. S. society and its institutions. Ultimately, views of the availability of opportunity in the U. S. shape educational attainment, at least at the K-12 level.

Similarly, contemporary studies of the children of immigrants indicate that their schooling experience is very much shaped by optimistic attitudes toward schooling, fueled in part by a sense of obligation to their immigrant parents to succeed in school (Kao & Tienda,



1995; Portes & Fernandez-Kelly, 2008; Portes & Rumbaut, 2001). In other words, children of immigrants are believed to perform better academically than their native-born peers because they possess an immigrant drive that is an extension of their parents' desire to achieve a better life for their family. The research on the optimistic nature of more recent immigrants as it shapes schooling outcomes suggests that this immigrant optimism may also shape post-secondary experiences, particularly in STEM fields which are often linked to lucrative careers and upward mobility (Wolniak, Seifert, Reed, & Pascarella, 2008; Zhang, 2008). An optimistic attitude toward schooling or "trusting the system" is characteristic of middle-class values and is often attributed to immigrant success across social science fields (Bonilla-Silva & Baiocchi, 2003).

Literature on the 2<sup>nd</sup> generation consistently identified a positive attitude toward schooling and upward mobility as a reason why they outperform their later-generation peers. Such optimism may also explain why students from a more recent immigrant background or working-class background more often choose fields that are linked to high-paying jobs. Indeed existing research on college major choice suggests that a belief in the possibility of upward mobility is linked to major choice among some student populations. Such patterns beg the question: does so-called "immigrant optimism" wane and under what conditions? Certainly, the challenges faced by immigrant populations in college cannot be overlooked since a more optimistic outlook may not protect against all sources of strife.

**Family interdependence.** One way that an immigrant background has played a demonstrated role in educational experiences and outcomes is through the role of the family. Family, or the value of *Familismo*, has been identified as a key factor in the academic adjustment of Latino college students (Arellano & Padilla, 1996; Hernandez, 2000; Keefe, Padilla, & Carlos, 1978). *Familismo* is characterized by a sense of familial obligation and interdependence which

often serves as a motivation for students to succeed, thereby improving their academic adjustment to college. A number of researchers have found the effect of family on academic adjustment to be particularly strong among children of immigrants who experience a strong sense of obligation to their immigrant parents to succeed in school (Fuligni, 2001; Fuligni, Witkow, & Garcia, 2005; Kao & Tienda, 1995; Portes & Fernandez-Kelly, 2008; Saunders & Serna, 2004; Tseng, 2004).

Other scholars have pointed out that while strong family ties can have positive effects on adjustment, the potentially negative impact of family obligations on students cannot be overlooked. For example, one study explored family obligations for twenty 1<sup>st</sup> and 2<sup>nd</sup> generation Latina immigrant college students and found that their family commitments made them vulnerable to increased stress, lower academic performance, and non-persistence (Sy & Romero, 2008). Thus, sociological literature indicates that immigrant experiences differ from those of native-born counterparts in two key ways: 1) perceptions of schooling and educational opportunity, 2) the nature of family interdependence. Thus, although immigrant generation plays an important role in shaping pre-college experiences and outcomes for Latinos, it has not been sufficiently explored in higher education research. Racial minority students have been treated as a homogeneous group, without specific attention to ways in which immigrant generation may shape specific noncognitive dimensions of persistence in STEM.

There is evidence from sociological studies of Latino educational attainment that immigrant generation shapes both perceptions of upward mobility and levels of family interdependence. There is limited work on students' perceptions of opportunity and the role that race potentially plays in shaping educational opportunity. There has been virtually no attention

paid to the potential role of immigrant generation in shaping noncognitive dimensions of persistence, namely, how students understand and respond to race and racism in STEM fields.

### **Statement of the Problem**

Specific attention to Latino underrepresentation in STEM fields has been limited in several ways. First, it has ignored unique characteristics of the Latino population, including ways in which immigrant generation or ethnic background may shape experiences and outcomes. Latinos are characterized as a homogeneous immigrant population, without acknowledgement that for generations Latinos and other communities of color have been denied equitable access to post-secondary education. This is significant because demographic trends indicate that Latino representation in higher education will only increase, especially in STEM and in engineering.

Secondly, studies of Latinos in STEM are conceptually limited because the study of race has essentially amounted to the use of race as static, pre-college variable that may or may not predict experiences and outcomes of Latinos in STEM fields. When race and racism are considered, quantitative studies have compared the experiences of all URM students to White peers. Thus, despite observed *racial disparities* in STEM degree completion rates, extant research evades an explicit discussion of race and racism.

Thirdly, there has been much documentation of factors that negatively shape persistence but much less attention to the individual persistence strategies students utilize to succeed in spite of the barriers they may face. Within literature on how students succeed in spite of negative experiences with racism, there has not been a unique focus on Latino students. Indeed, African American students have been described as resilient, but we know little about the ways in which Latinos potentially demonstrate resilience when they experience racialization and racism.

It is imperative that we now shift our limited focus on the numerical representation of Latinos students in STEM fields toward understanding students' subjective experiences with race and racism and how such strategies may shape persistence. Such focus may shed light on how to more meaningfully involve Latinos in STEM and authentically promote their participation, persistence, and leadership in these fields.

In light of higher education literature's limited recognition of Latinos, engagement with the ways in which race and racism affect persistence for Latinos, and how Latinos may respond to race and racism in STEM, this study explores how Latino males pursuing engineering degrees understand and respond to race and racism, how their understanding and responses to race and racism may be shaped by immigrant generation, and how their understanding and responses to race and racism may shape persistence. This study is guided by the following research questions:

- 1) How do Latino male engineering students understand and respond race and racism?
- 2) How might Latino male engineering students' understanding and responses to race and racism differ by immigrant generation?
- 3) How do Latino male engineering students' understanding and responses to race and racism shape persistence?

### **Purpose**

The purpose of this dissertation study is to explore the potential role of immigrant generation in shaping noncognitive persistence strategies, specifically, how Latino males in engineering understand and respond to race and racism. In exploring noncognitive persistence strategies, specifically how students respond to race and racism, this study will shed light on the specific experiences of a Latino sub-population: Mexican origin men pursuing a specific STEM

degree: engineering. Also, this study will specifically engage with race and racism by documenting how students understand these constructs and respond to the consequences of being racialized on a daily basis.

### **Key Terms**

Before proceeding to a description of how participants understood race and racism, it might be useful to establish definitions for these terms as well as their relationship to one another, as defined by sociological literature. First, *Racialization* refers to a sociopolitical process whereby individuals are prescribed a racial identity or put into a racial category based on observed physical characteristics, ancestry, or cultural attributes; and as a result of such categorization, occupy a particular position within a racialized hierarchy in American society (M. Brown et al. , 2003; Mills, 1999; Telles & Ortiz, 2008). Latinos are not a racial group, per say, but experience the process of racialization. Some social science researchers have downplayed the role of race in shaping educational conditions (Bonilla-Silva & Baiocchi, 2003) and emphasized the progress successive generations of Latinos have made in integrating into American life (Jimenez, 2010). Others posit that racialization is a viable explanation for ongoing inequities between Latinos and European immigrant groups.

Within the American racial hierarchy, images and stereotypes about African Americans, Latinos, and other racialized minorities that guide social interactions with them, regardless of whether an individual identifies with a particular racialized group (Steele & J. Aronson, 1995; Telles & Ortiz, 2008). For example, Telles and Ortiz (2008) state:

American society often stigmatizes those of Mexican origin, regardless of whether Mexicans are considered or consider themselves White, whether they are physically distinct, or whether they speak Spanish or have a Spanish surname or

accent. This racialization also creates shared personal and political identities, which often become the basis for collective political action (p. x).

Although race and ethnicity may have limited meaning for an individual, through processes of racialization, they are prescribed a racial identity and corresponding status that may delimit opportunity in society. *Race* as a construct, then, is fundamentally socially constructed and has implications for the subjective experiences for individuals within a racially hierarchically organized society. Racialization and race are central to sociological inquiry, or at least they should be, because of their direct implications for individual opportunity and mobility in society. Relatedly, *racism* is a term used to refer to social inequities on the basis of race. Racism, oft thought to be defined in strictly in terms of overtly racist comments, is not only interactional but structural. That is, it is best understood in terms of emerging and ongoing social and economic structural inequities supported by an ideological system of White supremacy (Brown et al., 2003; Mills, 1999; Telles & Ortiz, 2008). *Racism* is expressly used for the resultant oppression that may occur for racialized minority within a racial hierarchy. Thus, race is a construct; racialization is the process by which that construct is established for an individual, resulting in the establishment of an ever-changing/evolving *racial identity*. Racial identity is a prescribed/ascribed identity while ethnic identity or ethnicity, refers to the shared cultural traits, beliefs, and values of a particular group

Students' *understanding of race and racism*, is defined broadly as encompassing the following: how they view their own selves as members of a racialized minority group, the salience they attribute to race in their own experience, the factors that invoke the salience of their race within an engineering context, and the general ways in which they think about race and its relationship (or lack thereof) to educational opportunity. Students' *responses to race and*

*racism*, defined generally as the attitudes, behaviors, and practices that students engage in as a result of being prescribed, directly or indirectly, a racialized minority status. Students understanding and responses to race and racism are understood as distinct but interrelated constructs.

*Immigrant generation* refers to the generation in which an individual moves permanently to the United States from a different country. Early immigrant generations are distinguished from later immigrant generations by a more recent immigration to the United States. Generation since immigration is most often numbered from 1-3. 1<sup>st</sup> generation immigrants represent the first generation within a family to reside in the United States. 2<sup>nd</sup> generation immigrants refer to those who are born to immigrant parents and are the second generation within a family to reside in the United States. 3<sup>rd</sup> generation immigrants are those who are born to immigrant parents and are the third generation to reside in the United States. Those who are born outside the United States but immigrate at an early age are considered the 1.5 generation. 1<sup>st</sup> and 2<sup>nd</sup> generation immigrants are considered early generations while 3<sup>rd</sup> and subsequent generations (4<sup>th</sup>, 5<sup>th</sup>, etc.) are considered later generations.

## **Significance**

This study potentially contributes to the field of higher education by providing qualitative, in-depth information about noncognitive persistence strategies, specifically, how participants understand and respond to race and racism. This information may be used to guide practice and future research. It may be used to guide minority retention programs in how they might engage students of color in discussions of race and racism in the context of engineering.

Information about how Latino men in engineering understand race and racism may be useful to in how higher education researchers conceptualize race and racism.



## Chapter 2: Review of the Literature and Theoretical Frameworks

The primary goal of this chapter is to develop a framework for understanding the relationship between Latino male engineering students' understanding and responses to race and racism and their persistence in engineering. While there has been a proliferation of research on the persistence of underrepresented racial minority (URM) students in science, technology, engineering, and mathematics fields, centrally focused on preparing these populations to contribute to a diminishing technical workforce, direct attention to addressing race and racism has been conceptually limited. Extant literature is limited in its implication that race can be treated as a) static pre-college variable, b) is experienced in the same way by racialized minorities across contexts, c) subjective experiences of racialized minorities can be compared to those of Whites, and d) individuals experience race passively and without response. At a time when higher education is witnessing rapid growth of the Latino population, high demand for underrepresented racial minorities in STEM fields, but also a decline in educational attainment for specific racialized student populations (e.g. later generation Mexican-Americans and men of color), it is more important than ever to understand students' subjective experiences with race and racism.

That is, we must understand *students' understanding of race and racism*, defined broadly as encompassing the following: how they view their own selves as members of a racialized minority group, the salience they attribute to race in their own experience, the factors that invoke the salience of their race within an engineering context, and the general ways in which they think about race and its relationship (or lack thereof) to educational opportunity. Also, we must understand *students' responses to race and racism*, defined generally as the attitudes, behaviors, and practices that students engage in as a result of being prescribed, directly or indirectly, a

racialized minority status. Both students' understanding and responses to race and racism may shed light on how they persist in spite of the well-documented barriers to persistence in STEM fields for underrepresented racial minority students. Further, it is important to begin exploring how students' understanding and responses to race and racism may be informed by immigrant generation.

In order to connect students' understanding and responses to race and racism to persistence in engineering, this chapter is divided into three sections. First, I describe Critical Race Theory, its utility for understanding persistence strategies for underrepresented minority students, and implications for discussion of various forms of capital. Next, I discuss a physiosocial ecological framework for understanding the ontological nature of race and racism. Lastly, I offer an approach for understanding responses to race and racism based on cognitive reappraisal and sociological literature. Essentially, this chapter maps out how students' understanding and responses to race and racism are connected to a broader discourse on race, racism, and educational inequity.

### **Section I: Understanding Race and Racism: A Critical Race Theory (CRT) Perspective**

The most basic underlying assumption of this study is that race is an implicit, omnipresent, and powerful force that shapes educational experiences and opportunity in an American educational context. Race is taken as a fundamental prescript which shapes individuals, institutions, and the structures in the society in which we live. This condition is best described by Charles Mills (1999) as the *Racial Contract*, a system of global White supremacy that prescribes differential duties, rights, and responsibilities to Whites and non-Whites. Mills argues that the racial contract is “explanatorily superior to the raceless social contract in accounting for the political and moral realities of the world and in helping to guide normative

theory” (Mills, 1999, p. 120). If we consider, the extent of the ongoing disparities in experiences and outcomes between URM and non-URM students, it becomes clear that STEM fields are touted as democratic and equally accessible to all, but are actually spaces reserved for American and international elites. The observed educational inequities in STEM reflect a reality consistent with Mill’s portrait of a system of global White supremacy.

**Critical Race Theory.** Within the same vein of scholarship on race and racism is Critical Race Theory, an export from scholarship on race and law (Crenshaw, 1995; Ladson-Billings & Tate IV, 1995). Critical Race Theory seeks to make explicit the ways in which race and racism serve to subordinate specific racial/ethnic groups. The framework emphasizes race and racism as essential factors in understanding social inequality that is perpetuated and maintained by U. S. institutions. Ideologically, CRT challenges notions of neutrality and objectivity in higher education and contends that such ideas serve White self-interest, power and privilege (Delgado & Stefancic, 2012; Mills, 1999; Tate, 1997). Methodologically, CRT draws from a variety of disciplines and approaches to issues of racism. It seeks to bring attention to both historical and contemporary experiences with racism by drawing on the experiential knowledge of people of color (Delgado Bernal, 2002; Ladson-Billings & Tate IV, 1995). Ultimately, CRT is committed to dismantling institutions that perpetuate and maintain racist ideologies (Ladson-Billings, 1998).

A CRT framework in education asserts that racism is endemic to American life and shapes the experiences of people of color in higher education. More specifically, CRT in education challenges the dominant discourse on race and racism in educational theory, policy, and practice and examines how they are used to subordinate specific racial and ethnic groups (Solórzano, 1998). Solórzano and Delgado Bernal (2001) name five major tenants that

characterize a CRT framework in education: 1) centrality and intersectionality of race and racism; 2) challenge to dominant ideology; 3) commitment to social justice; 4) centrality of experiential knowledge; and 5) utility of interdisciplinary perspectives.

Critical Race Theory is particularly suited to studying the persistent disparities in degree completion for Black and Latino students in STEM fields because it focuses on social justice in education and ensuring equitable educational experiences and outcomes for communities of color (Delgado Bernal, 2002).

It is especially timely to offer a social justice perspective to the study of students of color in STEM fields because increasingly, the issue has been framed as one of global economic competitiveness rather than an issue of educational inequity. The rationale for studies on the topic has been a vested interest in maintaining dominance in science and technology. This desire to be the best, to be better than everyone one else technologically, scientifically, and economically may help to explain the ongoing challenge to transform competitive and discouraging STEM classrooms into supportive and nurturing environments for students. Ultimately, the Racial Contract and CRT frameworks highlight the ongoing significance of race in shaping outcomes and opportunities for individual members and groups in society. Among the tenants of CRT outlined for educational inquiry, two are particularly important to the study of persistence strategies among Latino males in engineering. For one, the centrality of race and assumption that race and racism operate within institutions of higher education is a guiding premise. Secondly, this study is motivated by an interest in social justice to improve our practical understanding of the persistence strategies of students of color in STEM fields (Delgado Bernal, 2002).

**CRT: Implications for capital frameworks.** Critical Race Theory has provided for the development of an understanding of how students respond to racialization. Examples of two theoretical contributions to CRT discourse include the concepts of Resistant Cultural Capital and the broader Community Cultural Wealth Framework. These capital frameworks represent an attempt of CRT scholars to extend the popular sociological exports of Bourdieuan social and cultural capital toward conceptual frameworks for understanding the experiences of racialized, minoritized students (Delgado Bernal, 2002).

**Resistant Cultural Capital.** Resistant cultural capital is a concept advanced by Sólorzano and Villalpando (1998) that highlights the ingenuity and resourcefulness of students of color who must tap into resources, they argue, that are not recognized as assets according to a Bourdieuan capital framework. They describe resistant cultural capital as the “critical navigational skills” marginalized students develop in order to succeed in higher education. Essentially, resistant cultural capital represents an ability of students to transform oppression experienced on the basis of class, race, and gendered identities into a motivation for success. Thus, students of color are racially marginalized but simultaneously engage in a process of resistance to that oppression. Resistant cultural capital is a valuable contribution to understanding the educational attainment of students of color because it places value on the ways in which individuals turn experiences with racism and discrimination into a motivation for success.

The concept of resistant cultural capital is an important contribution to educational literature on the educational experiences and outcomes of students of color. At the crux of the supposition that this alternative form of capital exists, is the idea that this is a form of capital that only racialized students of color can possess. It, thus, suggests that even in an educational

context where middle-class behaviors and values are the norm for success, non-middle class, and racialized, marginalized individuals can set the standards for success. In other words, even when the rules of the game are designed for students of color to fail, some succeed because they are able to tap into a strength that comes from surviving the margins of society. So how do students activate or express this resistant cultural capital? What does it look like? Is it embedded in an individual's attitudes or perspectives toward schooling? Does it operate at an individual level or is it better used as an explanatory tool for the resilience of communities of color overall?

Ultimately, as a singular form of capital, resistant cultural capital can be refined and ultimately more widely utilized if it were applied in more studies of the experiences of students of color.

**Community Cultural Wealth.** As a follow up to the concept of resistant cultural capital, Yosso (2005) developed a full conceptual model premised on the idea that communities of color possess cultural assets, accumulated over the life course and developed through experiences with marginality, that contribute to their success in an American educational context. Community cultural wealth refers to the assets that students possess and draw upon to persist within American schools. Yosso's concept of community cultural wealth can be divided into six sub-categories, which I will now describe.

First, aspirational capital "refers to the ability to maintain hopes and dreams for the future, even in the face of real and perceived barriers" (Yosso, 2005, p. 77). Linguistic capital refers to the communication skills acquired by being fluent in more than one language or language style. Familial capital is the community history, memory and cultural intuition provided by kin and social capital refers to the resources shared by people within the community (p. 79). Navigational capital refers to the "skills of maneuvering through social institutions" or the ability to navigate "institutions of not created with Communities of Color in mind" (p 80).

And finally, resistant capital, as defined by Yosso, is the knowledge and skill set “fostered through oppositional behavior that challenges inequality” (p. 80). The concept of community cultural wealth is an attempted revision of traditional forms of capital (i.e. Bourdieu’s social and cultural capital) that do not recognize the assets and wealth of communities of color (Delgado Bernal, 2002)

The basic premise of Community Cultural Wealth is that students of color possess forms of capital that are not valued in traditional schooling contexts but that are vital to the survival and success of students of color. Community Cultural Wealth has become increasingly popularized by scholars looking to centralize race while acknowledging non-material, noncognitive assets that are accumulated throughout the life course. While the momentum of Community Cultural Wealth in CRT circles is undeniable, left undefined is the field in which the proposed forms of capital operate is undefined (Bourdieu, 1986).

**Bourdieuian Capital.** Community Cultural Wealth is offered as a response to Bourdieu’s (1986) social reproduction framework. Community Cultural Wealth is an extension of the concepts of cultural and social capital that are central to Bourdieu’s framework (Bourdieu, 1986; Bourdieu & Passeron, 1990; Bourdieu & Wacquant, 1992). Cultural capital refers to the attitudes, behaviors, beliefs, and values that can be expressed and transmitted as a means of social or educational advancement (Bourdieu, 1986; Bourdieu & Passeron, 1990; Bourdieu & Wacquant, 1992). In education, cultural capital would include the attitudes, behaviors, and beliefs that allow one to be successful in secondary and post-secondary schooling contexts (Bourdieu & Passeron, 1990; McDonough, 1997; McDonough & Nunez, 2007). The concept of cultural capital moves beyond the understanding that financial capital alone leads to differential educational outcomes. Thus, cultural capital suggests a culture of attitudes, values, and beliefs

that can be expressed, used, and converted into valuable social, cultural, and material resources, that then, are transmitted into generational advantages (McDonough & Nunez, 2007).

Social capital refers to the advantage that is accumulated through interaction with social networks. It can refer to material profit or other forms of social and cultural capital (Bourdieu, 1986; McDonough & Nunez, 2007). Through membership in social networks, individuals not only access capital but also the assurance that their capital is protected by others who share in their dominant position (Bourdieu, 1986; Dika & Singh, 2002). Capital from social networks depends on the individual's ability to gain access to the group and its collectively held capital as well as the availability of resources (Bourdieu, 1986; Dika & Singh, 2002). That social networks collectively hold and grant or deny access to capital is a key aspect of their social reproduction function (Bourdieu & Passeron, 1990).

**Bourdieu's Concept of Field.** Field refers to the social spaces in which individuals act out struggles for various resources. Fields are spaces of contestation, wherein agents struggle with different means for varied ends (Dika & Singh, 2002; Swartz, 1998). For every field, there are "rules of the game" or rules by which individuals acquire various forms of capital, but these rules are not necessarily static and not made explicit to the actors within the field (Dika & Singh, 2002). Fields are not to be understood as physical spaces but as fields of forces, forces which shape individuals' struggles for position within it, and are in turn shaped by those struggles. Fields play an important role in reproducing social structures because they embody the arbitrary cultures which serve to dominate individuals in society. Understanding a field means understanding and making explicit the landscape which defines culture and exclusion (McDonough & Nunez, 2007).



Bourdieu's frame is one designed to understand differences in social classes and how those differences are maintained. Social class, for Bourdieu, was an instrument by which he was able to "bring the occupants of adjacent positions together in social space", describe those positions as part of social space, and to show that individuals belonging to a given social space are connected by habitus or taste (Bourdieu & Passeron, 1990; Wilkes, 1990). Bourdieu's concepts of social capital, cultural capital, field, and habitus work together as a method, or a way of thinking about the nature of social position and reproduction (Dika & Singh, 2002). Bourdieu's conceptual framework is particularly suited to education because he used the concepts of capitals, field, and habitus to explain how in educational settings that are supposed to be meritocratic, there are implicit rules that serve to promote advancement for some while excluding those who are not familiar with those rules.

The application of a Bourdieuan capital framework to studying students of color has been interpreted as a deficit approach because it suggests that students of color lack the requisite capital for advancement in education or upward social mobility, more broadly. Indeed Bourdieu does assert that within a given context, or field, certain forms of capital are deemed more valuable by others and that this is an implicit reality that shapes how individuals come to occupy social positions. However, Bourdieu does not indicate that certain forms are inherently more valuable than others, only that in a certain contexts forms of capital are valued over others as a means of maintaining class privilege and advancing the interests of those who possess the "right" forms of capital. To assert that students of color lack the requisite capital to succeed because they are not granted access is not a deficit perspective, but one that acknowledges the processes by which structures of inequality are maintained and passed down through generations. Critical

Race Theorists have advanced alternative capital frameworks in response to deficit applications of Bourdieuan social and cultural capital.

This study centralizes race in its theoretical framing and brings to light questions of the efficacy of capital frameworks for exploring the experiences of underrepresented racial minorities in STEM fields. It puts Bourdieuan and Community Cultural Wealth frameworks in conversations with one another by exploring noncognitive persistence strategies of a group of racialized young men. It underscores the importance of Bourdieu's concept of field, and suggests that in the highly competitive STEM context, there are more traditional forms of capital (as described by Bourdieu) that have a greater bearing on persistence. However, this study also provides evidence of that there are characteristics of resilience, strength, and undying hope present in participants that inherently shape their academic success. Some key questions emerge: in the context of STEM fields, are Yosso's proposed forms of capital an asset? Is there a predetermined sense of belonging to the Latino community that Yosso's model assumes? To what extent are different forms of social and capital valued at the expense of capitals espoused by Yosso in the context of STEM fields? It is my contention that a STEM context represents a field (in both a Bourdieuan and literal sense) that may privilege Bourdieuan forms of capital. Ultimately, this study draws centrally on a CRT framework to explore persistence in the possible forms of resistance, resilience, and noncognitive strategies.

## **Section II: Physiosocial Ecological Framework for Understanding the Ontological Nature of Race**

I draw from the field of philosophy of science to offer a potentially useful complimentary framework to Critical Race Theory: a framework for understanding the ontological nature of race and racism, advanced by Kendig (2011). A physiosocial ecological framework is a useful

theoretical approach to understanding participants' subjective experiences with race and racism across institutional contexts. Such a framework posits that race is best understood, as Kendig (2011) describes, "in terms of one's experience of his or her body, one's interactions with other individuals, and one's experience within particular cultures and societies" (191). Thus, the fundamental ontological assumption of a physiosocial ecological perspective of race is that one's body is the foremost context in which race is constructed, and that construction goes on to occur within each of the contexts in which an individual is embedded. The body is constantly engaged in "an ecologically-embedded experience" and thus race is not something prescribed, unmediated, but rather it is constructed through interaction with others and across multiple contexts (Kendig, 2011, 213).

When applied to the present study, a physiosocial ecological framework allows to us centralize the subjective experience of each participant and understand that they may experience racialization, race, and racism differently across the various contexts they encounter. Their experience with race is embedded within a complex ecological system that may be comprised of three distinct but related contexts: that of the broader society, the campus environment, and their engineering department and subfield (academic major). A physiosocial framework holds that as each individual moves through these contexts, there is interplay between their body, others in the environment, and the environment itself that shapes the construction of race and the racialization of individuals. This is particularly useful to counter the use of race in quantitative studies as a background variable.

### **Section III: Cognitive Racial Reappraisal Persistence Strategies of Bridging and Buffering**

Previous higher education literature has established that student persistence is shaped by academic and nonacademic factors. Research on racial/ethnic minority students has highlighted

the importance of contextual factors in shaping persistence, including experiences with racism in the campus environment (Cabrera, Nora, Terenzini, Pascarella, & Hagedern, 1999; Hurtado & Carter, 1997; Solórzano et al. , 2000). Thus, it is well established in higher education literature that nonacademic or noncognitive factors and persistence strategies are important, if not the most important, pieces in persistence.

**Noncognitive Persistence Strategies: A Misnomer.** While the use of noncognitive factors has gone uncontested, one might argue it problematic to suggest that the nonacademic strategies involved in racial/ethnic minority student persistence are devoid of cognition or do not involve cognitive thinking. In fact, literature from the field of psychology and neuroscience suggests that individuals are involved in a process of *cognitive reappraisal* when they encounter a stressful event, make meaning of a stressful event, and engage in specific thought processes or behaviors associated with that stressful event (Feder, Nestler, & Charney, 2009; John & Gross, 2004). As individuals engage in cognitive reappraisal processes, they become more resilient because they are better able to manage and reflect on negative emotions. In other words, “reappraising the meaning of a stressful event as less negative or more positive changes emotional reactions to the even and results in a more adaptive and resilient response” (John & Gross, 2004).

When applied to the study of college student persistence, one might deduce that racial/ethnic minority students are constantly engaged in a process of cognitive reappraisal as a result of stress associated with their racialized status. It is likely reasonable to assume that as racial/ethnic minority students encounter stress associated with their minoritized status, they engage in cognitive processes that manifest as what we have called nonacademic persistence

strategies. Thus, not only are cognitive processes inherently involved in what we observed in studies of racial/ethnic minority student persistence but central to such inquiry.

**Bridging and buffering behaviors.** The specific behaviors that students invest in as a result of stresses associated with their racial minority status within engineering resembled bridging and buffering behaviors of organizations (according to an open systems perspective) (Scott & Davis, 2007). As will be described in findings chapters, participants engaged with the environment to take advantage of available resources but managed to buffer themselves from negative elements of the environment (e.g. racial discrimination, stigmatization, stereotypes) through a variety of what can be referred to as *cognitive racial reappraisal persistence strategies*.

**Cognitive Racial Reappraisal Strategies.** This study explored participants' subjective experiences with race and racism, and in so doing, uncovered a number of *cognitive racial reappraisal strategies*, that is, cognitive reappraisal strategies based on reframing a more positive racialized status. I develop the following definition for racial reappraisal strategies:

The bridging and buffering strategies that allow racialized, minoritized students of color to protect (buffer) themselves from the negative aspects of a racially hostile college environment while simultaneously accessing (bridging) that same environment for the resources on which they inevitably depend. Such strategies may limit interaction and expand interaction with the environment as needed in order to attain needed resources. These strategies are deemed necessary by virtue of the nature of the college environment in which students of color experience racial hostility yet are dependent upon for resources. Collectively, bridging and buffering strategies represent an attempt of individual to protect a core academic

*identity as well as to redefine for others and/or themselves a socially constructed racial identity.*

The interrelated constructs of bridging and buffering and cognitive racial reappraisal strategies will be further developed in subsequent findings chapters that explore participants understanding and responses to race and racism.

### **Chapter Summary**

Extant literature in higher education has insufficiently engaged with race and racism. A key way in which scholars have engaged with race and racism is using Critical Race Theory to explore how students experience and respond to race and racism. However, the application of CRT in a STEM context has been much more limited as compared to its application in a broader higher education context. I propose the utilization of a physiosocial ecological framework for understanding how Latino men are racialized, understand race and racism, and respond to race and racism in engineering. This chapter has described CRT and a physiosocial ecological framework, and discussed the implications of using these frameworks for studying experiences of students of color. The following findings chapters will describe a proposed model for cognitive racial reappraisal strategies.

## **Chapter 3: Methodology**

In this chapter, I describe my methodological approach to exploring Latino male engineering students' understanding of race and racism. I will begin by providing an overview of the study as well as the ontological and methodological assumptions that guide its design. Next, I will describe key aspects of data collection and analysis, including a description of the challenges I faced in the field and in analyzing data. Lastly, I discuss several ethical considerations and study limitations. The purpose of this chapter is to provide a detailed and transparent account of how I arrived at the evidence that will be presented in subsequent chapters of this dissertation.

### **Section I: Study Overview and Design**

This dissertation study explored noncognitive persistence strategies of Latino males pursuing engineering degrees, specifically, participants' understanding of race and racism. A central focus of the study was on understanding how immigrant generation might shape noncognitive persistence strategies. Here, again, are the research questions that guided the study:

1. How do Latino male engineering students understand and respond race and racism?
2. How might Latino male engineering students' understanding and responses to race and racism differ by immigrant generation?
3. How do Latino male engineering students' understanding and responses to race and racism shape persistence?

In order to answer these questions, semi-structured interviews were conducted with individuals who self-identified as Latino men of Mexican or Central American origin and were pursuing an undergraduate or graduate degree in any field of engineering. Participants were recruited via

snowball sampling methods at two highly selective four-year institutions, one private and one public, located in California.

**Study Design.** The research questions guiding this study warranted a qualitative design. A qualitative design allowed for *exploration, explanation, and description* of the relationship between students' subjective experiences with race and racism and persistence. This study sought to explore the "themes and categories of meaning" surrounding the constructs of race and racism for participants (Marshall & Rossman, 2006, p. 34). Further, it focused on uncovering and explaining the conditions that made race and racism apparent, relevant, and/or salient to participants as well as the conditions and ways in which they responded to being racialized. Fundamentally, this study was focused on describing a potentially under-explored connection between students' understanding of race and racism and persistence in engineering. Ultimately, and perhaps most importantly, this study invokes the emancipatory nature of qualitative research by highlighting participants' problematizing of their own experiences, an interest in promoting their own persistence, as well as that of their own communities (Marshall & Rossman, 2006).

This study utilized semi-structured interview data. Semi-structured interviews combine the directness of survey instrument with an open-ended interview structure to produce focused qualitative data (Schensul, J. , & LeCompte, 1999). Semi-structure interviews allow for the exploration of a contextualized understanding of how participants' racialized, ethnic, and generational status identities are operationalized in their daily lives as aspiring engineers. Each interview lasted between 40-60 minutes and was audio recorded, following a process in which participants provided their informed consent to participation in the study and their voice be recorded. Participants were asked to describe, broadly, the experiences that brought them to their current engineering program, challenges and ways they overcome challenges in



engineering, and the role of their social identities in shaping their experiences (See Appendix D: Interview Protocol).

In addition to the semi-structured interview, this study also utilized demographic questionnaires as a tool for acquiring information about the background characteristics of individual study participants. The questionnaires asked participants to provide academic information (e.g. college grade point average, year in school, post-graduate plans, etc. ), socioeconomic status information (i.e. parental income), ethnic identification, and immigrant generation status (see Appendix C: Demographic Questionnaire).

**Assumptions Guiding the Study Design.** A qualitative approach embraces certain ontological, epistemological, axiological, rhetorical, and methodological assumptions about the nature of reality, the relationship of the investigator to what is investigated, the relationship between facts and values in the process of investigation, language used, and the overall approach to the investigation (Creswell, 2003; Marshall & Rossman, 2006; Maxwell, 2008). This study assumes that reality is subjective and multiple, as seen by participants in a study, that the researcher-participant role is fundamentally interactive, that evidence provided in a study is inherently value-laden and biased, and that informal, personal voice is appropriate in describing context-bound patterns and themes (Creswell, 2003; Marshall & Rossman, 2006; Maxwell, 2006). What follows is a description the specific ontological and methodological assumptions of the study, as guided by both Critical Race Theory and Kendig's (2011) framework for understanding the ontological nature of race.

**Ontological Assumptions.** In this study, the nature of reality is viewed as subjective and multiple, meaning that individuals experience a reality that is based on their unique perspectives and worldviews. Individuals might experience a shared reality or experience, but have an

entirely different understanding of that reality or experience because they have a unique worldview (Patton, 2002). Race is, ontologically, understood as a social phenomenon that is constructed as individuals physically move and are read through social contexts (Kendig, 2011). Further, not only is race real and constructed as individuals move through unique ecological contexts, but racialization serves to maintain a system of White dominance over non-Whites. A consequence of *race* and *racialization* is *racism* that is endemic to U. S. institutions. However, an individual's interpretation of race and racism is subjective and informed by an individual's unique perspectives and experiences. For this reason, it is assumed that quantitative studies invested in the predictive nature of a background variable of race fall short of adequately capturing subjective experiences with race and racism, which are inherently embedded and socially constructed within and across various contexts (Kendig, 2011; Creswell, 2003).

**Methodological Assumptions.** It is important to note that this study is situated within a higher education context characterized, at least to some extent, if not entirely, by a methodological conservatism that privileges quantitative investigation over that of qualitative inquiry. This orientation is evidenced in the proliferation of government and private agency funding for quantitative studies of educational outcomes in STEM for underrepresented racial minorities for their experimental nature and statistical generalizability. The only legitimate knowledge is defined as that which is unbiased and objective; where values, beliefs, and position of the researcher are detached entirely from the research process (Maxwell, 2008; Smith, 1983)

As Hylton (2012) points out, a Critical Race Theory approach is fundamentally invested in applying methodologies that disrupt the privileging of traditional epistemologies and paradigms. Even though CRT scholars may try to apply methodologies that centralize the voices of those who have been marginalized, they too sometimes appropriate or employ the

methodologies that have been used to legitimize the subordination of marginalized communities of color. Ultimately, “a CRT methodology should in part be characterized by its ability to eschew the passive reproduction of established practices, knowledge and resources, that make up the way types of research have been traditionally carried out” (Hylton, 2012, p. X). This begs the question: what constitutes a CRT methodology? Must it engage, specifically, non-traditional methodologies (e. g. testimonio, counterstories) and put individual scholars at risk of rejection from mainstream academic cannons? Hylton (2012) advocates for a “spirit of CRT” that is may combine various research techniques in responding and challenging subordination and oppression (Matsuda et al. 1993). This study draws on a qualitative, semi-structured interview design (albeit a traditional social science design) as an appropriate starting point for exploring other methodological approaches in future research on students subjective experiences with race and racism.

## **Section II: Data Collection**

**Site Selection.** Two four-year top-tier research universities were selected to serve as the primary data collection sites for this study. Both institutions were selected because they are highly selective, four-year institutions with large and highly ranked schools of engineering. A key difference between the two institutions was that one was public and one was private, which would presumably allow for an understanding of how noncognitive persistence strategies, including how engineering students understand and respond to race and racism, might differ across institutional contexts. With level of selectivity and demographic makeup being similar, I assumed similarities in the quality of the campus environment and focused specifically on individual level responses to race and racism across contexts. The comparison between a private institution and public institution was intended to shed light on the potential role of institutional

support in shaping noncognitive persistence strategies. A key difference between the two institutions, in terms of institutional support, was the presence of two distinct minority retention and support programs in STEM. These programs will be discussed in the context of institutional descriptions provided next.

**Public University of California (PUC).** PUC is a public four-year institution with a total of 27,941 undergraduate students enrolled in Fall 2012. Of the 2012 entering undergraduate class, the racial/ethnic breakdown is as follows: 34% Asian/ Pacific Islander, 32% White, 17% Hispanic, 3% African American, and <1% American Indian/Alaskan Native. In terms of gender, women outnumber men with a representation of 55% of the total undergraduate student body compared to 45% male enrollment. Within engineering fields, current enrollment figures indicate that electrical and mechanical engineering are most popular, with 724 and 391 total undergraduates enrolled, respectively.

**Minority Retention Program (MRP).** PUC offers underrepresented (African-American, Latino, American Indian, and female) students a range of services including: academic and professional workshops; access to financial support and internships; research programs; clustering of students into the same sections of classes to support academic collaboration and high performance; academic enrichment programs; academic advisement; and support of ethnic based engineering student organizations. The program's website describes the MRP as committed to diversifying the STEM workforce by promoting undergraduate retention for unrepresented students. Every participant at PUC reported participating in the MRP, even if only in his first and second years.

**Private California University (PCU).** PCU enrolled a total of 3,021 students for their freshman class. Of the entering 2012 undergraduate class, this was the following racial/ethnic

composition: 45% White, 23% Asian, 13% Hispanic, 6% African American, and 2% American Indian/Pacific Islander. The gender breakdown was 52% female and 48% male. A total of 15% of the entering freshman class was admitted to PCU's School of Engineering.

**Diversity and Persistence Program (DPP).** Institution #2 offers underrepresented (African-American, Latino, American Indian, and female) students access to a learning center, computer lab, study space, and work area. Support staff provide undergraduate students assistance with academic-related issues and provide counseling on engineering trends, career options, and graduate education. DPP is similar to MRP in that connects students with ethnic based engineering programs. However, it follows a less "hands on" model than the MRP in that it does not cluster incoming students together in classes. Participants described limited involvement with the DPP.

Again, a key institutional difference between PUC and PCU was the structure of their minority support services in STEM. MRP provided a structured support opportunity for engineering while DPP provided less structured support for all STEM URMs. The implication of involvement in these programs will be discussed in subsequent findings chapters where I describe students' experiences with being racialized in the college context.

**Characteristics of study participants.** Participants were selected for this study if they self-identified as being of Mexican or Central American descent. Participation will was limited to these two ethnic groups because they are similar in terms of their racialization experiences, socioeconomic characteristics, and mode of incorporation into the United States (Fernandez-Kelly, 2008; Hao & Pong, 2008). Other Latin American immigrant groups (e. g. Cubans, Argentineans, etc. ) were be excluded from the study because they potentially enter the United States under different political and economic contexts and thus have different experiences as

immigrant groups incorporating into the United States. Other criteria for inclusion in the study was that individuals self-identify as male and be majoring in any engineering subfield at either institution. Participants with a range of college grade point average were included in the study.

**Graduate students.** Initially, the study was designed to include only undergraduate students, however, given the limited number of Latinos in engineering, it was difficult to reach the desired number of participants without extending recruitment to graduate students. Further, the themes that were emerging in interviews with undergraduate students lead me to question how the observed persistence strategies among undergraduate Latino students would differ for graduate students. Extending recruitment to more deeply explore emergent themes is consistent with a grounded theory approach commonly utilized in qualitative research. An amendment to my initial application for Institutional Review Board (IRB) approval was submitted and approved before recruitment extended to graduate students. It is significant that the limited number of available Latino male students prevented me from achieving the targeted number of undergraduate participants.

In an effort to reach the target number of undergraduate participants, an amendment was made to the initial Institutional Review Board (IRB) application so that I could recruit undergraduate students at other institutions. Even with these attempts, undergraduate participants were difficult to find. Thus, analytical and methodological decisions drove the recruitment of a total of six graduate students. Ultimately, extending recruitment was a strategic decision to ensure greater representation of later generation students, who were also difficult to find. Graduate students described encountering racially hostile climates for longer periods of time than the undergraduate students, and demonstrated greater levels of reflection regarding their experiences. Other than the level of detail and sophistication with which they were able to

talk about race and racism, there were no differences observed in the actual noncognitive persistence strategies of understanding and responding to race and racism.

**Immigrant generation.** In terms of immigrant generation, the study was designed to provide both an institutional comparison as well as a comparison between early and later immigrant generation Latinos. A significant attempt was made to recruit an even number of participants from early immigrant and later immigrant generations, however, the final sample consisted far fewer participants who identified as being of a later generation background. In an attempt to recruit later generation Latinos, the study criteria was expanded to include four additional institutions in both Southern and Northern regions of California. The impetus for extending the study to new institutions was to capture the true demographic makeup of the Latino population in California, but as it turns out, 2<sup>nd</sup> generation Latinos (children of immigrant parents from Mexico or Central America) were overrepresented in the sample. Previous research in California has noted enrollment disparities within the UC system with regard to immigrant generation, namely, that the more prestigious institutions within the UC system are comprised almost entirely of immigrant students. For example, UC Berkeley has been titled “The Immigrant University” (Douglass, Roebken, & Thomson, 2007) due to the disproportionate number of second-generation students (including non-Latino students) enrolled.

The majority of participants were second generation Americans, born in the United States to Mexican immigrant parents (27 total 2<sup>nd</sup> generation participants). Many of the 2<sup>nd</sup> generation study identified their parental income as low to middle<sup>1</sup>. Many of the 2<sup>nd</sup> generation participants

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<sup>1</sup> Income definitions: Lower income group=\$0-29,999, Middle income group= \$30,000-49,000, Higher income group= \$50,000 and above. Immigrant generation 1. 5= individuals brought to U. S. as children, 2<sup>nd</sup> = children of immigrant parents, and 3+ = grandchildren of immigrants or later. Participants in their 5<sup>th</sup> or 6<sup>th</sup> year are referred to as 4<sup>th</sup> to avoid making them potentially identifiable.

attended majority-minority schools comprised almost entirely of Latino students in low socioeconomic areas. They articulated challenges associated with growing up and going to school in high-poverty neighborhoods where gang activity and negative peer influences were common. Such experiences are consistent with existing literature which indicates that Latino youth are concentrated in under-resourced schools, live in high-poverty areas, and experience a host of barriers to accessing quality and equitable education (Garcia & Bayer, 2005; Valencia, 2004). Table 1 provides descriptive information for early (1. 5 and 2<sup>nd</sup> immigrant generation) Latino men in the study sample.

**Table 1 Characteristics of Early Generation Participants N=30 (2<sup>nd</sup> Generation N=27; 1. 5 Generation, N= 3)**

| <b>Participant (Pseudonym)</b> | <b>Engineering Major</b> | <b>Year</b>     | <b>Transfer</b> | <b>Parental Income</b> | <b>Immigrant Generation</b> |
|--------------------------------|--------------------------|-----------------|-----------------|------------------------|-----------------------------|
| Nicolas                        | Mechanical               | 3 <sup>rd</sup> | Y               | High                   | 1. 5                        |
| Leonardo                       | Civil                    | 3 <sup>rd</sup> | Y               | High                   | 2                           |
| Emmanuel                       | Mechanical               | 4 <sup>th</sup> | N               | High                   | 2                           |
| Bruno                          | Mechanical               | Grad            | Y               | High                   | 2                           |
| Salvador                       | Mechanical               | 2 <sup>nd</sup> | N               | Middle                 | 2                           |
| Miguel Ángel                   | Mechanical               | 4 <sup>th</sup> | N               | Middle                 | 2                           |
| Maximiliano                    | Electrical               | Grad            | N               | Middle                 | 2                           |
| Mateo                          | Mechanical               | 3 <sup>rd</sup> | N               | Middle                 | 2                           |
| Martin                         | Undeclared Eng.          | 1 <sup>st</sup> | N               | Middle                 | 2                           |
| Lucas                          | Electrical               | Grad            | N               | Middle                 | 2                           |
| Jerónimo                       | Mechanical               | 3 <sup>rd</sup> | N               | Middle                 | 2                           |
| Isaac                          | Mechanical               | 3 <sup>rd</sup> | Y               | Middle                 | 2                           |
| Gabriel                        | Mechanical               | Grad            | N               | Middle                 | 2                           |
| Emiliano                       | Mechanical               | Grad            | N               | Middle                 | 2                           |
| Diego                          | Mechanical               | 5 <sup>th</sup> | N               | Middle                 | 2                           |
| David                          | Chemical                 | 3 <sup>rd</sup> | N               | Middle                 | 2                           |
| Daniel                         | Mechanical               | 4 <sup>th</sup> | N               | Middle                 | 2                           |
| Andrés                         | Mechanical               | 3 <sup>rd</sup> | N               | Middle                 | 2                           |
| Alejandro                      | Chemical                 | 2 <sup>nd</sup> | N               | Middle                 | 2                           |
| Agustin                        | Mechanical               | Grad            | N               | Middle                 | 2                           |
| Sebastian                      | Undeclared Eng.          | 1 <sup>st</sup> | N               | Low                    | 1. 5                        |
| Ramon                          | Industrial Systems       | 4 <sup>th</sup> | N               | Low                    | 2                           |
| Matias                         | Computer Science         | 3 <sup>rd</sup> | N               | Low                    | 2                           |
| Juan Pablo                     | Electrical               | 2 <sup>nd</sup> | N               | Low                    | 2                           |



|           |                 |                 |   |     |     |
|-----------|-----------------|-----------------|---|-----|-----|
| Juan Jose | Chemical        | 2 <sup>nd</sup> | N | Low | 2   |
| Ian       | Undeclared Eng. | 2 <sup>nd</sup> | N | Low | 2   |
| Felipe    | Mechanical      | 3 <sup>rd</sup> | N | Low | 1.5 |
| Benjamin  | Civil           | 2 <sup>nd</sup> | N | Low | 2   |
| Ángel     | Mechanical      | 4 <sup>th</sup> | N | Low | 2   |
| Adrián    | Aerospace       | 3 <sup>rd</sup> | N | Low | 2   |

Among later generation participants, 3 out of 7 were low income and 3 out of 7 reported a low parental income. Only 1 participant, among later generation students, indicated that their parents were middle income. None of the later generation participants were transfer students, whereas 4 of the 30 2<sup>nd</sup> generation students reported being transfer students. Table 2 provides descriptive information for 3<sup>rd</sup> generation Latino men in the study sample. Table 3 and Table 4 list participants by institution.

**Table 2 Characteristics of Later Generation Participants N=7**

| Participant (Pseudonym) | Engineering Major | Year            | Transfer | Parental Income | Immigrant Generation |
|-------------------------|-------------------|-----------------|----------|-----------------|----------------------|
| Santiago                | Computer Science  | 5 <sup>th</sup> | N        | High            | 3+                   |
| Tomas                   | Mechanical        | 3 <sup>rd</sup> | N        | High            | 3+                   |
| Alexander               | Computer Science  | 3 <sup>rd</sup> | N        | High            | 3+                   |
| Samuel                  | Mechanical        | 3 <sup>rd</sup> | N        | Low             | 3                    |
| Rodrigo                 | Computer Science  | 3 <sup>rd</sup> | N        | Low             | 3+                   |
| Pablo                   | Electrical        | 2 <sup>nd</sup> | N        | Low             | 3+                   |
| Joaquin                 | Mechanical        | 3 <sup>rd</sup> | N        | Middle          | 3+                   |

**Table 3 Participant Information and Demographics (Institution #1: PUC) N=22**

| Participant (Pseudonym) | Engineering Major | Year            | Transfer | Parental Income | Immigrant Generation |
|-------------------------|-------------------|-----------------|----------|-----------------|----------------------|
| 1. Santiago             | Computer Science  | 5 <sup>th</sup> | N        | High            | 3+                   |
| 2. Matias               | Computer Science  | 3 <sup>rd</sup> | N        | Low             | 2                    |
| 3. Sebastian            | Undeclared Eng.   | 1 <sup>st</sup> | N        | Low             | 1.5                  |
| 4. Mateo                | Mechanical        | 3 <sup>rd</sup> | N        | Middle          | 2                    |
| 5. Nicolas              | Mechanical        | 3 <sup>rd</sup> | Y        | High            | 1.5                  |
| 6. Alejandro            | Chemical          | 2 <sup>nd</sup> | N        | Middle          | 2                    |
| 7. Samuel               | Mechanical        | 3 <sup>rd</sup> | N        | Low             | 3                    |
| 8. Diego                | Mechanical        | 5 <sup>th</sup> | N        | Middle          | 2                    |
| 9. Daniel               | Mechanical        | 4 <sup>th</sup> | N        | Middle          | 2                    |
| 10. Benjamin            | Civil             | 2 <sup>nd</sup> | N        | Low             | 2                    |
| 11. Leonardo            | Civil             | 3 <sup>rd</sup> | Y        | High            | 2                    |
| 12. Tomas               | Mechanical        | 3 <sup>rd</sup> | N        | High            | 3+                   |
| 13. Joaquin             | Mechanical        | 3 <sup>rd</sup> | N        | Middle          | 3+                   |
| 14. Gabriel             | Mechanical        | Grad            | N        | Middle          | 2                    |
| 15. Emiliano            | Mechanical        | Grad            | N        | Middle          | 2                    |

|                 |                 |                 |   |        |   |
|-----------------|-----------------|-----------------|---|--------|---|
| 16. Martin      | Undeclared Eng. | 1 <sup>st</sup> | N | Middle | 2 |
| 17. Lucas       | Electrical      | Grad            | N | Middle | 2 |
| 18. Agustin     | Mechanical      | Grad            | N | Middle | 2 |
| 19. David       | Chemical        | 3 <sup>rd</sup> | N | Middle | 2 |
| 20. Salvador    | Mechanical      | 2 <sup>nd</sup> | N | Middle | 2 |
| 21. Juan Jose   | Chemical        | 2 <sup>nd</sup> | N | Low    | 2 |
| 22. Maximiliano | Electrical      | Grad            | N | Middle | 2 |

**Table 4 Participant Information and Demographics (Institution #2: PCU ) N=15**

| Participant (Pseudonym) | Engineering Major  | Year            | Transfer | Parental Income | Immigrant Generation |
|-------------------------|--------------------|-----------------|----------|-----------------|----------------------|
| 1. Adrián               | Aerospace          | 3 <sup>rd</sup> | N        | Low             | 2                    |
| 2. Emmanuel             | Mechanical         | 4 <sup>th</sup> | N        | High            | 2                    |
| 3. Felipe               | Mechanical         | 3 <sup>rd</sup> | N        | Low             | 1. 5                 |
| 4. Juan Pablo           | Electrical         | 2 <sup>nd</sup> | N        | Low             | 2                    |
| 5. Andrés               | Mechanical         | 3 <sup>rd</sup> | N        | Middle          | 2                    |
| 6. Jerónimo             | Mechanical         | 3 <sup>rd</sup> | N        | Middle          | 2                    |
| 7. Ángel                | Mechanical         | 4 <sup>th</sup> | N        | Low             | 2                    |
| 8. Rodrigo              | Computer Science   | 3 <sup>rd</sup> | N        | Low             | 3+                   |
| 9. Bruno                | Mechanical         | Grad            | Y        | High            | 2                    |
| 10. Alexander           | Computer Science   | 3 <sup>rd</sup> | N        | High            | 3+                   |
| 11. Ramon               | Industrial Systems | 4 <sup>th</sup> | N        | Low             | 2                    |
| 12. Pablo               | Electrical         | 2 <sup>nd</sup> | N        | Low             | 3+                   |
| 13. Ian                 | Undeclared Eng.    | 2 <sup>nd</sup> | N        | Low             | 2                    |
| 14. Isaac               | Mechanical         | 3 <sup>rd</sup> | Y        | Middle          | 2                    |
| 15. Miguel Ángel        | Mechanical         | 4 <sup>th</sup> | N        | Middle          | 2                    |

In terms of geographic location, most participants grew up in areas in and around Los Angeles County (e. g. South Central Los Angeles, East Los Angeles, Pomona, Irvine, Anaheim, and Long Beach); central California (Bakersfield, Salinas, Fresno, San Fernando Valley, San Gabriel Valley); surrounding counties (San Diego, Riverside); and out-of-state (Michigan, Washington). A total of 5 participants were born outside of the United States but brought as children, making them 1. 5 generation Americans.

**Recruitment.** Participants were recruited via purposeful selection approach (Light, Singer, & Willett, 1990) in which individuals are selected based on the assumption that they can provide information needed to address research questions for the study (Maxwell, 2006). This approach allowed sampling to be guided by needs of the study rather than by some other kind of

random selection. A more random approach would be appropriate to a quantitative approach in which generalizability to a large population is a goal of the study (Maxwell, 2006).

In order to recruit participants, I first combed through content on engineering department websites for each institution and identified contact information for retention program directors, student advisors, and other support staff. These contacts were forwarded an e-mail (reviewed and approved by the Institutional Review Board) to send to their student list-serves. Secondly, I requested that student support staff allow me to leave fliers in their offices. Lastly, I searched for engineering and Latino student organizations via university websites and recommendations from participants. At both institutions, I was invited by students to attend student group meetings and make an announcement regarding the study. I stayed for the duration of these meetings and wrote research memos on the content or topic of each meeting. Students who expressed interest in participating in the study were asked to take a flier and contact me directly.

Recruitment for the study was extended to additional institutions in an attempt to capture a wide range of experiences and backgrounds, including later generation students who were proving difficult to find and PUC and PCU. A total of 49 interviews at a total of 6 institutions were conducted, but ultimately, only 37 from 2 institutions were included in analysis, in order to preserve the original intended comparison between a public a private institution. Ultimately, the comparison between the two minority retention programs was more compelling to report on than a potential comparison between early and later generation students from a mix of institutional types. Data from an institution from which I was able to gather the highest number of study participants (N=10) was not included because the unique characteristics of the institution warrant a more appropriate comparison.

Mid-way through recruitment, I changed the language of recruiting materials. Initially, fliers and recruitment e-mail headers called for “Latino engineers” but I became aware that students may not fully identify with that particular label, so I revised recruitment materials to reflect non-racializing language. I changed subject line e-mails and fliers to read, “Calling all engineers!” and e-mailed via registrar offices on both campuses if student records identified them as Latino.

In an effort to learn more about the MRP and DPP programs, I e-mailed directors and staff members of both programs to request a meeting. Neither director was able to accommodate this request; however, I did meet with student support staff for each program that were able to provide additional information about the programs as well as some of the challenges they saw in supporting persistence of Latinos in engineering, specifically. Both emphasized the underrepresentation of Latinos in engineering and the need to connect incoming Latinos with co-ethnic peers.

## **Procedures**

Individuals who expressed interest in participating in the study were provided information about the study and a consent form to review. Specifically, I asked participants to review the study purpose and criteria for inclusion listed on the consent form. Students who expressed interest in participating in an interview and indicated that they met the study criteria were asked to fill out a demographic questionnaire and indicate dates and times which they were available for a 60 minute interview at the location of their choosing. Participants filled out demographic questionnaires and sent them back to me via e-mail. Those who did not were asked to fill out a questionnaire during the interview, following an informed consent process. Each interview lasted approximately one hour. Interviews were held at local eateries near campus and

some in a private office. Interviews were conducted during the 2013-2014 academic year, with most being conducted in late fall and early winter.

### **Nature of Interviews**

The semi-structured nature of interviews was appropriate for a study exploring students' understanding and response to race and racism because it allowed for discussion of a predetermined set of questions as well as opportunities to probe beyond listed protocol questions. Participants were allowed to revisit questions and to describe their experiences in ways that sometimes deviated from the protocol (Schensul et al. , 1999). The interviews consisted of three broad content areas: pre-college experiences, challenges and strategies for success in engineering, and subjective experiences with social identities (i.e. race and immigrant generation).

### **Section III: Analysis**

It is important to note the interconnectedness of data collection and analysis. As I was collecting data, I was continuously engaged in the process of identifying themes and patterns in the data. This was primarily achieved by writing research memos during or after student group meetings, immediately following interviews with study participants, and during the process of transcribing the interviews. Memos provide a space where a researcher can reflect on any and all aspects of the research process or their role in it. They allow for the development of analytic insights that inform subsequent analysis processes (Maxwell, 2005). For example, memos are a place where the researcher can record thoughts about aspects of the research that are disconcerting or puzzling (Birks, Chapman, & Francis, 2008). Essentially, my memos captured my experiences during the interviews in terms of technical aspects, content covered, as well as my reflections on my role as a researcher. For example, some of my memos described bodies of

literature that might be informed by the findings I was uncovering. All of the memos I wrote were compiled and revisited throughout the analysis and writing stages, serving as a tool for noting different interpretations to the data.

Moreover, memo writing provided a space in which I was able to reflect on my own ethnic and racial identity development, my own responses to race and racism, and the extent to which immigrant background and my unique physiosocial ecological context shape my educational trajectory. I experienced a multitude of emotions throughout the research process and captured them in research memos, contributing to somewhat of a preliminary, meta-analysis of my journey through this dissertation. This meta-reflection is described in greater detail later on in this chapter within the context of researcher positionality.

In addition to analytic memo writing, transcription also served as a vehicle for data analysis. After conducting 49 interviews, of which 37 are reported on in this study, I transcribed each audio file verbatim. Transcribing the interviews personally allowed for several advantages over enlisting a professional transcription service. First, it allowed me to immediately note any conflicting information from a participant or flag content that is interesting in some other way (Bird, 2005). Secondly, transcribing audio files myself allowed me to re-engage deeply with each interview, and this helped me to remember characteristics of individual participants (Bird, 2005). As someone technically trained by a professional transcription company and methodologically through my graduate level coursework, I felt that the best way to ensure quality transcription was to perform this task first-hand.

Following data collection (conducting interviews) and preparation (memoing and transcribing after interviews were conducted), I then began a more formalized analysis process. I first engaged in a preliminary, inductive coding round in which I looked for general themes

related to the stated research questions. From this open coding process, I generated a preliminary coding schema based on extant literature on URM student experiences in STEM (Weston et al. , 2001).

After transcripts were fully coded using this open and focused coding approach, I created a final list of codes and pulled quotes from transcripts for each theme. I created a Word document in which all themes were listed and evidence was provided. This served as a basis for initial outlines of my findings sections. To ensure reliability of coding, I uploaded all transcripts into Atlas ti software and recoded them, looking for confirming and disconfirming evidence of my claims. My coding in Atlas ti mirrored my coding by hand, and allowed for easier retrieval of evidence for claims. By retrieving text both "by hand" and using coding software, I ensured that I was capturing all evidence related to a particular theme area.

#### **Section IV: Ethical Considerations and Limitations**

My positionality as a researcher fundamentally informed the design, data collection, and analysis of the study. My own understanding of race and racism was primarily shaped by my experiences as a later-generation Mexican-American (Chicana) living in California as well as my educational background in Chicana/o studies. The story of my own family's life in the United States, and their struggles to gain equitable access to educational opportunity, provided the impetus for studying students' subjective experiences with race and racism in the context of STEM. In my life, immigrant generation, ethnic identity, race, and racism have been deeply intertwined and so I wanted to unpack the meaning of these constructs, and how they became operationalized in daily life, for study participants.

#### **Racialized Chicana**

This research is fundamentally informed by the intertwined educational trajectories of me and my mother. My story begins with me attending college as a child, accompanying my mother as she pursued an undergraduate degree at California State University, San Bernardino. I witnessed her struggle for several years as a single mother and full-time student. My earliest memories are of us standing in line, waiting to be seen at the campus financial aid office, the county office for Aid to Families with Dependent Children (AFDC), and the Riverside Housing Authority to apply for Section 8 low-income housing. Even after graduating from college, my mother (along with my older brother and me) became homeless. Through these experiences, I came to reject the myth of meritocracy and became interested in observing how educational opportunity (or lack thereof) is constructed and maintained by societal institutions (e.g. prisons, military, and institutions of higher education).

A childhood spent on a college campus shaped my interest in the race, ethnic identity, and educational opportunity. I recall an experience in which my mother was enrolled in an introductory Spanish language course and received low marks on an exam. When my mom talked to the professor about it, he told her that she should already know Spanish because she is Mexican. “You should know this,” he said. My mom explained to me that her Spanish was lacking because she attended racially segregated schools where students were made to feel ashamed of being Mexican and forbidden from speaking Spanish. Why *would* she know Spanish if throughout her K-12 schooling her teachers prohibited speaking Spanish in the classroom? I knew early on that this professor was wrong to make assumptions about my mother without considering that historically, Mexican-Americans have faced punishments for speaking Spanish and as a result, many later generation Mexican-American individuals do not speak the language.



Though I was not directly impacted by this experience, I was frequently met with the expectation to speak Spanish in my own life. Beyond being annoyed by the expectation that I speak Spanish, I also experienced disconnection from other Latinos who deemed me to be “Whitewashed.” Admittedly, it was disappointing but validating to hear the experiences of later generation students in this study who shared these same experiences. I felt disheartened by, but understood deeply, the pain of being rejected by same-race peers while simultaneously experiencing racial stigmatization and discrimination. During the data collection process, I felt ever fortunate to have found Chicana/o studies as an undergraduate student, which helped me to develop ethnically and racially in ways that some participants did not get to develop.

Further reflecting on my experiences as an 8-year old “college student,” I remember my mom asking on the first day of every class whether the professor would have a problem with me sitting in during lecture. Most didn't take issue but one professor humiliated my mother in front of a group of students by yelling at her, “What’s wrong with you? Why would you bring your child to class?” Even as a child, I understood that the dynamics of race, class, and gender were at play in this interaction and that my mom, even without me there, would not feel welcomed in that particular classroom environment. This instructor demonstrated a lack of sensitivity to the struggles my mother faced and further instructed me that individuals on the margins of society are not often given the opportunity to escape.

As, essentially, a participant observer of my mother’s experiences as a poor, single mother, and transfer student, I am deeply moved the level of resilience that she had to display in order to successfully complete her undergraduate degree. She also demonstrated a profound critique of U. S. social institutions in our daily life. Her critique imbued me with a deep understanding of social injustice and awareness of my own status as a racialized woman of color

within a racial hierarchy. I took as fact that the color of my skin, first and foremost, limited my opportunities in life, along with other aspects of my identity (including my gender identity as a Chicana female). As a consequence of my observations of my family's trajectory in the United States and my mother's political teachings, I reject meritocratic narratives and am concerned with downward social mobility of racialized minority groups.

Admittedly, engagement with race and ethnicity in my own life has been prioritized over engagement with other aspects of my social identities (i.e. gender). I have had such a strong female role model in my mother that I've always felt empowered by my gendered identity. I felt protected by an incredibly fierce single mother. Meanwhile, I curiously observed my brother develop his own gendered identity in the absence of a father and the negative consequences associated with his racialized masculinity (such as police harassment). Thus, the salience of race and racism in my experience, coupled with a desire to learn more about the intersection of racial and gender oppression, largely motivated this study's specific focus on Latino men.

I chose specifically to focus on Latino male engineering students, not only because of extant gaps in information on their experiences, but also because of my observations of my brother's educational experiences while pursuing his undergraduate degree in mechanical engineering. I observed that most of his friends were non-Latino international students or Latino students with Mexican immigrant parents. There didn't seem to be anyone else like my brother on our respective college campuses within the University of California system. That is, I observed that later generation Chicanas and Chicanos born to later generation parents (like my mom), were much more rare than one would expect, given the extent of our nativity in this



**Figure 1.** My brother, the engineer, at his college graduation

country. Thus, I wanted to understand how, for students like my brother, immigrant generation, race, and racism were operationalized in daily life via the meaning they constructed around these social constructs.

As a result of my own positionality, I possess what Dolores Delgado Bernal (1998) calls *cultural intuition*, that is, a cultural knowledge base, or a presumed familiarity with the experiences of my respondents. I am proficient in the language, terms and ideas they share which allows to me to care more deeply about and adequately capture the stories shared by my respondents. Rather than compromise the quality of the research or “bias” what might otherwise be a more “objective” process, my shared positionality as a racialized individual allows me better access and understand their experiences. However, a deeper understanding and connection

formed with participants did not mean that I imposed my attitudes or beliefs on them. Rather, I shared my experiences following interviews and offered support and encouragement based on my working knowledge of the experiences of college students attending highly selective institutions.

**Reciprocity.** It would be unethical to not acknowledge the great gift participants gave to me in sharing their stories. They spent valuable time, which they really couldn't spare because of their demanding schedules, to talk openly about deeply personal issues related to their social identities. Obviously, I could not provide participants with information about engineering since that is not my field of study, but I did make every effort to provide students with general information about the graduate school application process or resources that I thought could be of use to them. For example, one participant was interested in educational research and exploring literature on engineering education. I referred him to resources, offered the opportunity to attend the American Educational Research Association conference as co-presenters, provided instruction in qualitative methods, and wrote a letter recommending him for an internship. This was my way of contributing to the lives of my participants, though it was certainly minimal in comparison to their contributions to this study.

**Privacy and Confidentiality.** For this study, a main consideration was maintaining participant privacy and data confidentiality. Maintaining privacy of participants meant ensuring that no identifiable information was linked to responses. If a participant's identity were linked to his response, that may have negative consequences since he shared personal information and perspectives about his experiences in engineering. Given this concern, all participants were assigned pseudonyms. Pseudonyms were also assigned to the institutions where participants are

enrolled because the small number of Latino males in STEM majors at each institution makes students potentially identifiable should the name of their institution be revealed.

**Limitations.** As with any study, there are several limitations to the proposed study. Some of these limitations are common to qualitative research. For one, findings regarding persistence strategies cannot be generalized to all Latinos or Latinos at other institutions. Furthermore, the quality of the research is inextricably tied to my skills as a researcher. The quality of the data depends on how well I craft and articulate interview questions. The quality of findings depends entirely on my analytic skills and the extent to which I am able to check with participants on their accuracy. Indeed, every aspect of the study is limited by my own faculties.

In addition to the aforementioned limitations, this study is also limited in that the two institutions from which interview participants will be selected are located in one geographic location of California. Future research might expand the study to different institutional types, different geographic locations, and to additional ethnic subgroups in order to gain a better understanding of the role of immigrant generation and ethnicity in shaping noncognitive persistence strategies among Latino men in engineering. For example, a study of Puerto Rican male engineering students in New York might further complicate the ways in which we understand racialization for students in STEM.

Yet another limitation of the proposed study is that focuses on men in engineering, to the exclusion of women and students in other STEM subfields. Women are excluded to provide an in-depth account of the gendered and racialized experiences of Latino males, although will be the intended sample for future study designs. Other STEM fields were excluded to provide for a more detailed look at one specific field. Such limitations, however, potentially serve the interest of specialized, in-depth information about a specific student population.

## **Chapter 4 Pre-College Educational Experiences and Contexts**

This dissertation sought to explore participants' noncognitive persistence strategies in engineering, namely, how participants understood and responded to race and racism. Again, guiding research questions were: 1) How do Latino males pursuing engineering degrees understand and respond to race and racism? 2) How might participants' understanding and responses to race and racism differ by immigrant generation? And 3) how does a participant's understanding of race and racism shape noncognitive factors in their persistence? Before proceeding to a discussion of specific answers to these questions, it is necessary to establish a portrait of these young men and the educational experiences that lay the foundation for their understanding and responses to race and racism.

Such experiences provided them with an understanding of themselves as part of a racialized ethnic group. That is, pre-college schooling experiences gave participants at least a cursory understanding that they belonged to a group that, as a whole, had differential access educational opportunities as compared to other racialized groups. Ultimately, this inspiring group of young men offered a description of their pre-college educational experiences and insightful critiques of several schooling practices that negatively affected them and members of their community. Participants saw themselves and their success in engineering as inextricably linked to the upward mobility of their families as well as a broader social context that they were determined to improve.

### **Section I: Pre-College Learning Contexts and Educational Experiences**

This section will describe characteristics of 2<sup>nd</sup> generation participants' pre-college learning environments and early educational experiences. Specifically, I will provide examples of participants' educational experiences that largely reflect negative schooling practices

identified in extant literature on students of color. Such examples demonstrate that participants were racialized before setting foot on a college campus, providing them with some awareness of themselves as members of racialized ethnic group. In the context of this dissertation, such experiences also shed light on the contexts that would inform participants understanding of race and racism in college.

**English as a Second Language (ESL).** An example of a form of tracking that influenced the lives of some study participants occurred in the form of placement in English as a Second Language (ESL) classes early on in their schooling (Daoud, 2003; Oakes, 1985; Valencia, 2004). Three participants who were placed in ESL as children suggested that such placement might have done disservice to them and their ability to learn given that they were already able to read, write, and speak English clearly. Although the three participants did not immediately declare that they were erroneously placed in ESL courses, upon reflecting and talking about their experiences during our interview, they noted that they were probably placed in these courses without cause, as is often the case for Latino students (Valencia, 2004). For example, one participant described:

I was placed in English as a Second Language class. Even though I had been in English class since starting school. *I never actually had trouble speaking English.* I was really fluent. It was actually easier to me than Spanish. I thought that was interesting. When the class did English I would have to move to another classroom where we did activities. I remember we would have to look at a picture and write what it is in English. So I thought that was kinda taking a step back. I can do this but it was like... [sigh].

This participant's reflection demonstrates his feeling that there may be some negative consequences associated with unwarranted placement in ESL. His statement is also reflective of the way participants described their pre-college educational experiences and contexts: they talked very generally about their experiences and then revealed specific experiences that demonstrated an awareness of stratified educational opportunities that negatively affected Latinos and/or students from lower socioeconomic backgrounds. For example, this same participant went on to say:

My parents didn't think of it as holding me back because the way the teacher explained it was that if I passed this one test they would put me right back. At the time I was just doing it. I didn't mind because it was easy. I never thought about missing out on what everyone else is learning. I mean, it wasn't like it was... at the moment I didn't really think it was time wasted because as a kid you don't really want to be in school anyways...*In a way it was time wasted because maybe I should have been doing other stuff.* But at the same time I don't think it affected me negatively. It is not like I did bad in English classes. I never failed. It wasn't hurting me in any way. But I guess just maybe in that sense, I could have done more.

Here, this participant describes how his placement in ESL was “not wasted time”, but that in a way it was because “I should have been doing other stuff.” He, like other participants in describing their experiences, appeared to be conflicted about his feelings. Overall, participants were reluctant to assert that they had experienced educational disadvantage but, as this quote illustrates, they did allude to an understanding that they did indeed experience some educational disadvantages. Thus, though not all participants described 1) being in ESL or 2) feeling



disadvantaged by their placement in ESL, this participant's story exemplifies both what might be identified as an educational disadvantage and an understanding of the potentially negative consequences associated with being a member of a racialized ethnic group.

Participants demonstrated some awareness that they, as Latinos concentrated in high poverty schools, faced unique challenges to educational opportunities. Participants did not explicitly posit that they were victims of an unjust schooling system, but they did describe specific schooling practices and conditions that may disproportionately affect Latino students. Besides placement in ESL, participants talked at length about the challenges associated with not having access to rigorous math and science curriculum and how this would later be a challenge to their persistence in engineering.

**Access to math and science.** Several participants felt unchallenged in the areas of math and science and felt that had their schools provided greater opportunities for development in these areas, they could have been better prepared to face the demands of post-secondary engineering programs. For example, one participant described feeling completely unchallenged in high school math and science courses and that this had a negative consequences for his persistence in engineering, again a well-documented occurrence for Latinos in higher education. Not even by enrolling in community college as a high school student was he able to receive challenging math and science curriculum. He said:

I was extremely bored in high school...honestly; school was a joke to me. It was too easy. I was extremely boring to me. I took classes in elementary school and did dual enrollment in elementary and middle school. And in middle school I did dual enrollment in middle school and high school. Then when I went to high school I was already like 'Eh. I have my stuff together.' *The community colleges*

*there couldn't supply me with more math and science classes because I had already gone too far and they only had so many classes that were offered for math and science.* They were like, 'You cannot take anything here because you have already taken the AP courses for it.' I was like, 'Okay so what do I do? I want to learn.' Honestly, that hindered me with my capabilities of going further in my learning because the next closest community college was like an hour away.

This participant described how he took the initiative to pursue math and science curriculum at local community colleges, but even after doing this, felt that he was not as prepared for college engineering courses as he might have been had he been provided a more rigorous math and science curriculum. The feeling of not being challenged in the areas of math and science, as well as a demonstrated awareness that students attending more affluent high schools might have greater access to rigorous math and science courses, was a common theme among participants. For example, another participant described how a peer he met through an internship had significant advantages in high school that allowed him to be strong in math and science, attend a prestigious university, and compete against other students in engineering. He said:

I didn't have the resources he had. As a high school student he went to a math and science academy. *Who goes to those schools? Not people like us. Not poor people. Rich people.* His parents had the money to put him into schools like that. Whereas as a high school student he was probably one of the smartest in the nation; undergraduates [like him] usually come from high schools that are math and science academies. If you are there you probably had the right education. Coming here [to this institution] it is hard for me to compete with a lot of the

students here because my math is not nearly as good as the people here. So all I do is struggle because I have never done this stuff. Some guys are like ‘oh I learned that in 8th grade’ because they are smart and went to good schools. *They had the right education.* Where I had to really struggle. I would compare it to having had to stumble my way here. They were like, if you consider athletes, *they were trained...well. I wasn't trained well and it was like: ‘go race.’* Eventually I am catching up to them but it was a lot messier than for someone who already had a clear path.

As participants became aware of negative schooling practices like tracking, they took steps that helped propel their achievement in math and science, allowing them to become highly identified with these fields. An example of an instance in which a participant became aware of tracking practices was when he learned of a placement test he took before starting middle school that would determine his math placement in middle and high school. He described becoming angry when he learned that this this single test would dictate his math trajectory from that point forward:

...About that test...if I would have at least known about it you know studied for it the night before or taken it more seriously, I could have been placed in some advanced math in my 6<sup>th</sup> grade year other than having to wait for algebra my 8<sup>th</sup> grade year...So because I didn’t take advanced math every year in middle school, I wasn’t allowed to take higher advanced math in high school. Then when I got to high school, I started taking geometry and trigonometry, pre-calculus and calculus. So that was my more four years. I didn’t know you could take geometry and trigonometry at the same time. That was also something that was

not to my knowledge. I couldn't look to my counselors. My counselors weren't necessarily looking for me at that point. It wasn't until I was doing a lot much better and I had a current record of doing well in school and like being involved in leadership activities, that I was finally noticed.

This participant expressed frustration that by default, his middle school and high school did not promote him taking more advanced math classes but instead used a single assessment to determine his placement for the rest of high school. It is important to note that this participant expressed feeling that he could not rely on his school counselors for help in enrolling in more advanced math classes and that only after he demonstrated a high level of involvement and visibility on campus did counselors become helpful to him. Essentially, this particular experience taught this participant that he needed to "get noticed" and stand out if he wanted to receive the benefits associated with being highly school-identified by teachers and counselors. Consistently, participants described being interested in math and science and at some point, their demonstrated interest led to educational opportunities to participants. For example, it was common for participants to say: "To me, calculus and like basic math seemed pretty cool. I liked figuring out puzzles... Me and a fellow colleague who was also a Latino.... were all doing really well and we were motivated to be in school. We were motivated for science and math specifically and we were put into these accelerated math programs..."

**Racializing experiences and microaggressions.** Consistently, participants from lower socioeconomic backgrounds described their elementary, middle, and high school experiences as "not that great." Students said their schools, "didn't have a lot of resources" and that "no one really cared." One participant said, "It was your typical lower income school where you feel no one really cares- but there were some teachers who cared and they would really push students

and that was good. I thought it was good.” Early on in their schooling, participants became aware that all schools are not the same in terms of resources and expectations for students. For example, one participant expressed feeling that his teachers in high school had lower expectations of him specifically because he was Latino. When he asked his counselor to enroll him in all Advanced Placement (AP) classes in high school, for example, he perceived a negative reaction from counselors. He stated:

They were not expecting that at all. They were like ‘oh you are Latino!’ I was like ‘that shouldn’t matter. Why are you labeling?’ Honestly that shouldn’t matter. The label of Latino or African American or Caucasian shouldn’t matter. I don’t want to see that. Just see the person as a person and see what they are capable. People are much more capable of doing things than other people think. I have been trying to prove that to people. They are always like ‘Oh you are Latino and you are one of the smarter ones.’ I am like, no. I just care about my education.

Here, this participant expressly identifies differential treatment based on his appearance. This is an example of an experience that signaled to a participant that he was part of a racialized group, for which there were certain associated expectations and beliefs about academic ability.

Similarly, another participant described experiencing a racial microaggression when he lined up to register for AP testing. He described how the school staff member responsible for processing AP exam sign-ups assumed that he was in the wrong line. This participant recalled this experience after thinking about what he would say in an interview he knew would touch on the subject of race. He stated:

I was talking to my girlfriend about this before like I don't know what I'm going to say in this thing. She asked me if there was ever had any experiences where I felt discriminated. Other than students saying that you are the smartest Mexican, and things like that, was in high school when I was going to register for my AP tests. It was the same place that people pick up their bus passes- the cashier's area I guess. When I went up to the lady, she pointed and said, 'the bus passes are in that line.' I was just like 'I'm registering for my AP history test.'

In this interaction, the school staff member assumed the participant needed to buy a bus pass instead of register for his AP exams. The interaction itself might be interpreted as an example of a racial microaggression, but lower expectations for Latino students, more broadly, represents systemic racism toward Latinos (Solórzano & Ornelas, 2004).

Although other participants described similar experiences with racial microaggressions, they sometimes struggled to find the language with which to describe their racializing experiences. That is, participants did not use the terms "racial microaggressions" or "racializing experiences" to describe their experiences, but described how they thought certain experiences were "weird" or off-putting. For example, another participant shared an experience in which one of his high school teachers suggested he emphasize his racial background to get a scholarship. While this experience was not inherently negative, it was one that made the participant reflect on his racialized identity or think about how he was perceived by others as a racialized individual. He stated:

When I was in high school I was in an academy and there were other kids- I don't remember their stories- but I felt weird about it because *one of the college essays I wrote for the private schools I applied to was about that, where I felt weird.* My

counselor, she was a White woman, and I remember ... one of the things she told me to do [in my college essays]. . . she was like, ‘I really think you need to let the college admissions people know about your ethnic background and the challenges you faced in that.’ She was encouraging me to write a story about the challenges I faced in being in the engineering academy and the racism from some students and how I overcame that. Which felt like weird writing about it because I felt like she was putting me into that category of overcoming things when I didn’t really feel like it was that severe. But I felt like she was telling me to play it up to get in.

This is, again, a prime example an experience that made a participant aware of their membership in a racialized ethnic group. Many participants expressed confusion about what these experiences meant and struggled to find the language with which to describe their feelings. It was clear, however, from participants’ descriptions of these experiences that pre-college contexts laid the foundation for their understanding of themselves as racialized young men and of how race is socially constructed.

**Implications for identity development.** In addition to the aforementioned educational inequities, participants also dealt with the repercussions of growing up in racially segregated, low-income areas. One of these repercussions had to deal with the threat of violence on a daily basis. Participants talked at great length about the extent to which, within these tough contexts, they actively tried to construct an identity that was associated with doing well in school, particularly in the areas of math and science. They were strategic about finding ways to stand out to teachers and administrators who might otherwise expect them to not do well. This section will describe participants’ peer context (both at school and in their home communities) and how,

in light of, and perhaps because of, the negative conditions surrounding them they managed to emerge as highly school-identified students.

**Criminalizing Latino youth.** Participants who grew up in impoverished neighborhoods talked at length about the prevalence of gangs within their communities and, for some, their families. Gangs, according to participants, presented not only a threat to their physical safety but to the pursuit of their educational goals. This participant's statement is representative of what many participants said about their pre-college contexts:

I grew up in [a farming town in] California. I was born and raised there. My parents are immigrants. When I was growing up, they've always worked in the fields...the community itself was not the best community to grow up in. I lived against the street from people who were affiliated with the gangs. The area that I grew up in a lot of the affiliate members lived in the same area. I grew up knowing some of them but gangs never really caught my interest. I strayed away from them...growing up I was always told to stay away from gangs.

Yet another participant described that he could not leave his house and that there was immediate danger if he were to walk down the street. He described an incident in which he wore the "wrong" colored clothing: "When I was a kid, I was walking to school and I was wearing a red t-shirt, red backpack, and with red on my shoes. I had all red on. I passed a house and this guy gave me a weird look. He was like 'what do you bang?' I was like 'no I don't.' He told me I can't wear that. This was directly in front of my house." This participant went on to state, "That is *the reason why I wanted to get into education- because I realized where I came from.* When you are in it, you don't think about it. If you ever read the statistics from my school- we lost like four different people in my class. Two of them were shot." It was common for



participants to describe the prevalence of violence and gangs within their neighborhoods and schools, which reflects an unfortunate and unjust reality for communities of color. Ultimately, participants articulated that their schooling identity was developed in a context in which they might otherwise be criminalized.

Indeed, participants seemed to describe two options for identity development: becoming highly identified with school or being criminalized. This is consistent on extant literature which documents that Latino and Black youth are more likely to be suspended from school, punished, enrolled in special education, continuation schools, or pushed out of school altogether (Saenz & Ponjuan, 2011). Indeed, deeply rooted perceptions of black and brown men as criminals often results in increased policing and punishment of these students (Giroux, 2003; Lipman, 2003a; Rios, 2006, 2009). In light of their recognition of the negative consequences associated with being criminalized or affiliated with gangs, participants were very clear that they made every effort to distance themselves from negative peer influences and to stand out academically. Discussions of pre-college experiences centered on participants' keen awareness of the negative consequences of not doing well in school and the vigilance with which they resisted those alternative pathways. Such discussions demonstrated limited opportunities for participants' identity development as Latino youth, as well as participants' recognition of themselves as racialized.

Given that many participants were concentrated in high poverty, under-resourced educational environments, how did they manage to develop in the areas of math and science and successfully compete for admission to an engineering program? As participants responded to the question of "how did you find your way into your engineering program?" it became clear that participants managed to navigate negative pre-college environments by setting themselves apart

from peers, particularly in the areas of math and science, throughout elementary, middle, and high school. All participants from lower socioeconomic backgrounds essentially described a process by which they distanced themselves from negative peer influences, sought positive attention from teachers, and became highly identified with school, especially in the areas of math and science.

**Developing a school identity.** Participants' early educational experiences were characterized by teachers identifying them as "the smart one" among their peers and them working hard to maintain their perceptions others' perceptions of them as being highly identified with school. Many participants described how they felt that they had to stand out amongst their peers in order to not be identified as a behavior problem or "bad student." This is consistent with literature on the educational experiences of Black and Latino students, particularly boys, that indicates that they are made to feel either invisible or hyper-visible (E. Brown, 2003; Giroux & McLaren, 1989; Langhout, 2005; Lipman, 2003a, 2003b). For example, one participant described his perception his peers in his high school often sought negative attention:

I think it is because you either get noticed or you don't...I think other students aren't noticed right away so they have other forms of getting noticed in a [bad] way. If you can't get noticed in the classroom, you're going to get noticed outside of that. I don't know I was always an outspoken person and extrovert in my mind. And that's how I gained a lot of friends inside of class.

Awards and recognitions that further propelled participants' identity as "good students." For example, one participant described:

The first month I received an award... You were only awarded one a year if you were qualified, if you were recommended by teachers and I didn't understand

what it was. At that time, I just really liked learning. I liked picking up a book. ... I realized: ok I'm definitely going to get this award next year and I wanna continue to impress my teachers and the same manner that I have been this year and I continue the strung of good grades and involvement in school.

Yet another participant described how he was consistently outperforming peers without putting forth much effort but went on to describe how he didn't feel like he didn't deserve to be number one. He described his experiences in the military and how such experiences provided him with a sense of "real accomplishment":

Throughout the four years of high school I was number one, but even then I could tell that I never even put a little bit of effort into it. I would see that the other ones that were in the top 10% they were putting hours into studying- library after school, putting hours into it. I would never go to those events. If there was a test maybe I would skim the pages but never actually read. I never took notes and I still managed to get A's. Even though I was number one in my class I never felt that I earned that. So that's why I joined the armed forces after high school. I wanted to see if I had something to be proud of. ...It was the first time I actually ever felt that I accomplished anything. Not everyone can say that they did that and if they do, you cannot buy that. You can't buy the title.

This participant joined the armed forces and described earning a titled that one "can't buy." It may be interpreted that this young man's desire to join the Armed Forces as a way of "proving himself" was his way of asserting value in a society that racializes and dehumanizes brown bodies (Lipman, 2003b; Pérez, 2006). This participant demonstrated a high academic self-concept, but also doubt about whether he could trust that perception given that he attended a

high school in which there were not as many high performing peers to compete with as he found in college. This was true of other participants who, upon arriving at college, began to question their academic achievements and their ability to compete with peers from better-resourced high schools (a topic discussed further in subsequent chapters).

Thus far, I have demonstrated that participants characterized their pre-college schooling environments as high poverty contexts with stratified educational opportunities. In order to do well in school, participants described having to stand out amongst peers as high achieving students, particularly in math and science. This is consistent with existing literature that indicates Latino boys are often met with low educational expectations and are mostly assumed to be behavioral problems in the classroom (Lipman, 2003a, 2003b; Rios, 2006, 2009). As they secured their status as talented students in math and science, they were able to take advantage of the educational opportunities that were available to them (e. g. accelerated math programs within their high school and the local community college). While their pre-college learning environments may not have inherently been supportive of their talents, they were able to extract enough support to successfully develop a science identity. The development of an identity associated with a chosen STEM field has been identified as an important factor in persistence for underrepresented racial minority students, and it is sometimes that very identification that can cause students to leave when faced with negative college experiences (Chang et al. , 2011). The following section describes just how participants successfully navigated the college going process amidst a host of challenges related to post-secondary opportunity.

## **Section II: College Choice Process**

Findings regarding Latino college choice process were consistent with extant literature in terms of the significance of teachers and high school counselors providing post-secondary

information. For Latino students, the college choice process is characterized by lack of information, misinformation, and encouragement to pursue less prestigious institutions (if any) (Gonzalez, Stone, & Jovel, 2003; Hossler, Schmit, & Vesper, 1998; McDonough, 1997; Perna & Titus, 2005). Yet, despite lacking much of the necessary information needed to apply for college, participants in the study managed to apply and gain acceptance to a prestigious, four-year, public or private university. Much of this was achieved through the intervention of teachers or counselors who helped in the college going process (McDonough, 1997; Moore III, 2006)

**Parental support for college.** Overall, parents wanted their sons to attend college. All parents who were college educated expected their children to attend college. Even among parents who had less than a high school diploma was a desire to send their children to college. For example, when asked whether his parents had gone to college, he answered:

No my parents were not college educated. My mom, in Mexico, she was very highly educated and in a way in high school, but when she wasn't in school, she was very scholarly. So she would say 'you got it from me.' So she wanted me to go to college. It was like okay, 'I actually do wanna go to college so that it's great for us.' So my dad was very supportive of me. They were very supportive of me going to college.

For example, one participant shared that he felt that immigrant parents more often encourage their children to pursue more lucrative careers like medicine, law, and engineering than other parents, even when their children aren't necessarily interested in or committed to those fields. He stated:

The way I see it is if your parents are from Mexico, they only know manual labor, retail, farm work, and they come to the US and they work as a janitor or custodial or factor work, whatever it may be. They only know a few prestigious jobs. They know lawyer, doctor, maybe engineering, and maybe a priest as professional career, and maybe a teacher. Jobs that are associated with higher incomes are doctor, lawyer, and engineering.

He went on to provide an example of his roommate dropping out of engineering because of a lack of true commitment. He said:

My roommate for example he was in engineering, he didn't like engineering. But his mom is a cleaner. She cleans a certain lady's house whose sons are both engineers. Both her sons are engineers and she sees that this lady is doing very well so she pushes her son to go into engineering because he can do well. And she wants the best for him. So she thinks that by pushing engineering on him, even though she doesn't know what engineering is, she pushes it on him and thinks that is the future if her son becomes an engineer. His parents came from El Salvador and Guatemala. He ended up dropping out of engineering because he didn't like it. It wasn't his thing. It was too hard.

Here, this participant was asked to identify the significance of immigrant generation in his own life, but aptly points out that immigrant generation is often a factor that drives STEM major selection (Ma, 2009; Simpson, 2001). Though immigrant generation has not often been considered in terms of its potential implications for STEM participation and/or degree completion, the few quantitative studies that exist have found that immigrant generation is a significant predictor of STEM major choice (Ma, 2009). The explanation for this finding has

typically been that language difficulties often prompt first generation immigrant students to pursue technical fields (Ma, 2009). Though language accessibility is certainly a consideration in undergraduate major choice, language alone does not take into account sociological conditions among children of immigrants that may motivate such decision-making, as this participant and this study highlight.

Indeed, immigrant parents were often unable to provide post-secondary information to their sons about college but helped their children get to college by providing them with other forms of support (that are the focus of the next chapter in this dissertation). Most participants affirmed that their parents had a strong desire to see them go to college and supported their education indefinitely; many articulated the challenge of having immigrant parents unfamiliar with the American educational system. This was a common statement among participants at both institutions:

I would say my parents always wanted me to go to school but they didn't know anything about college. I don't know. I was just self-motivated, I would say. I just really liked school. I do see...I do remember that it was difficult because I didn't really know about the college process until my junior year. I was a little difficult because everyone was talking about going to college and I kinda thought it was like a guarantee, type thing. Apparently it wasn't. You have to apply and all this crazy stuff.

Another participant echoed the challenge of having parents with more experience in the workforce than in the post-secondary education system. He said:

...Both my parents...they don't have careers or anything like that. Like my dad has two jobs. So you know they never had a lot of experience relating to

education. So they don't know how it is. Especially coming from a high school like that. They don't know what it's like to try to go somewhere good. They don't know about SAT prep classes. They don't about you know those little things like how to fill out a FAFSA. So me and my sister did all of this stuff on our own. . .

Indeed, some participants said they knew nothing about how to apply to college. Many described experiencing shock upon learning of the prestige of their undergraduate institution. For example, one participant described not knowing what he was in for in terms of the academic demands of college. He stated:

I didn't even know this school existed until I applied for it the day of...I didn't know if my GPA was a good one. I just had done really well in the other things, all of the small tasks that I had done previously where things. I just knew enough through the door. But now it's more of struggle.

Lack of awareness of institutional selectivity and type was true for both students and parents. This is, again, consistent with college choice literature that indicates that low-income and students of color are often working with limited information about college (McDonough, 1997). Most participants described experiences in which they tried to explain to their parent that going to a prestigious, four-year institution was different in many ways from their local community college. One participant described:

Originally when I had applied and got accepted, I told my father 'I got accepted!' He was like, 'It's just a school. You can go to community college here.' Yeah. It didn't matter how much I tried to explain to him. He never really understood. It got to the point where I just started thinking 'I don't care what he thinks at this



point. ' Maybe he will understand later. But I am going to prove to him that I can do it. This is going to be for him. It is not for me.

While participants overwhelmingly described their parents as supportive of them applying and attending college, limited information about why a student would need to go somewhere beyond the local community college meant that some parents discouraged going away for college. One young man described:

So it was really tough to decide between what my family wanted and what I wanted...they really wanted to keep me close. My sister and I are the last ones. All my other siblings are all gone, married, and have children of their own. So my parents will feel like they have an empty nest, I guess. Once I'm gone, that will be it, so they didn't want me to go far, but I wanted to go far.

Here, this participant points out that out of love for their son and a desire to protect and care for him, his parents wanted to keep him close to home. They weren't necessarily aware of the opportunities a more prestigious undergraduate degree could afford their son. One participant understood that, "Parents want the best for their kids. They want their kids to go to college. All the parents want their kids to go to college but the kids with the immigrant parents don't know how." Ultimately, this participant pointed out what is perhaps the most universal of truths: that all parents want the best for their children. Although parents were not able to provide information about the college choice process, they supported their sons by providing them with forms of support that, I argue, 1) reflect forms of capital identified by Yosso's community cultural wealth model (Yosso, 2005) and 2) are unique to immigrant parents and their children (Fernandez-Kelly, 2008; Hao & Pong, 2008; Harris et al. , 2008; Portes & Fernandez-Kelly, 2008; Portes & Rumbaut, 2001). The unique ways in which immigrant parents shaped

participants' beliefs about educational opportunity, more broadly, are the focus of Chapter 5: Ethnic Identity and the Context of Immigration.

**Gendered differences in parental support for college.** For mostly all participants, parents emphasized college going. The vast majority of parents wanted their children to go to college and supported them going to college. However, there were a few that didn't understand why a college degree was necessary for their son. Interestingly, some participants described negative attitudes, specifically from their fathers, about them going to college, suggesting that there are indeed gendered differences in support from Latino parents (Zarate & Ronald, 2008). In this study, support for college from participants' fathers looked different than it did from their mothers. This suggests that there are not only gendered differences in support for boys and girls applying for college, but gendered differences in the support from parents. For example, one participant said of his father:

He actually didn't want me to come. He wanted me to stay and he was like 'you are going to stay and work with me. You are going to keep this family up.' That is originally what happened to my bigger brother. He didn't go to college. He also got accepted here and a bunch of other [universities] but he didn't go.

For this participant, his father's encouragement to work instead of go to school was motivated by his lack of understanding of the college going process and of the potential benefits of obtaining a college education. Given the family's economic struggle to survive, it is not surprising that this father opted for his children to work out of high school to help support the family. Ultimately, it was out of economic necessity that some fathers impressed upon their sons the need to get a job out of high school rather than go to college. For other participants, their fathers' disapproval of them going to college seemed less innocent and became an outright

source of contention between father and son. For example, one participant described feeling that his father wanted to teach him a lesson; wanted to demonstrate that because he had it hard, he was going to make his son's life hard. This participant said that he wouldn't accept money from his parents because he "got the sense that from my dad, specifically.... his attitude was, I started from nothing...he was able to develop something. So he feels like I should be able to do the same." Another participant described having to keep applications a secret from his father because he so disapproved of him applying to college; and that eventually, the father acted as if he was responsible for his college attendance. For this participant, the difficulty of applying for college was compounded by issues with his father. He described:

Come senior year, I start writing my applications. My dad knew none of this. He was against it. At first he wanted me to go to college, and then when I said I wanted to live at college and move out of the house, he was like 'no, you are going to live here and go to [community college]... you can live here and you can commute every day.' So he was very against it and he said 'no.' I was like 'mom, I know what I want to do?' She was like, '*mijo*, you do what you want to do. I support you.' So basically we went behind my dad's back and I eventually he did find out...I told my dad, 'you need to do your taxes, you need to do your taxes.' My mom knew why but my dad was like 'why? I still have a few months.' I told him that I knew I had to apply just to see what I could get. It doesn't mean I'm going; it's just to see what I could I get. So I applied for financial aid and did the FAFSA. My high school had a little workshop where you did it there and the counselors would go around and see if you needed help. So I did that. Then I got my acceptance letters...I was like 'oh my God, I'm going.' And it comes to

housing. I was like ‘mom, I need \$400 to put a down payment for housing.’ She was like ‘okay, here is my credit card. Just do it.’ My dad had no idea. So that summer, I was like ‘Dad, I’m going to [college].’ He knew I was going but I didn’t tell him all the details. I said ‘I am going, I am going to study this, I am going to live on campus.’ By then he was like ‘okay, whatever, you win.’ Now, at this point, he is like ‘my son has been very successful. He is at college. I have supported him from day one.’ Which is a lie. That’s how I got to college.

While this participant expressed some resentment that his father was against him going to college, and thus took measures to keep his application process a secret, another participant used a strategy of explaining the financial support he would be getting from his institution. He described:

My dad didn’t want me to and I was just like ‘I am going to do this.’ I am like dad, ‘It is fine.’ He thought that they were gonna give me money that I was just going to have to pay back. I was like ‘Dad, you don’t understand. They are giving me a full ride to go and I want to take advantage of that.’ I never told him, you can’t afford to take me to college because that would be horrible. But I was like ‘I’m being offered this much. I am never going to get offered this much again. I am going to take advantage of it because it is what I can do.’

It is important to reiterate that almost all parents, both mothers and fathers, were in support of their sons attending college. Though it may have been the case that it pained parents to see their son leave home and move away for college, like many parents, they understood that their son had to leave the nest and supported their decision to do so. For some of the Latino males in this study, however, they experienced difficulty in gaining approval from fathers who

adamantly opposed their son going away for college, mostly because they didn't understand what benefit this would bestow on their son. On the other hand, another participant said that his father pushed him so hard it actually made him not want to study in high school. He described:

So like when I was in high school, my dad was one of those fathers who try to push you... he was really strict and at the time, I don't know, he was pushing me too hard. So that kinda threw me off from going to school so. . remember when I said my dad was strict in high school, he is not like that anymore but he still wants me to check in to the house and if I bring friends over, it's like a hassle. He will be like snooping or asking questions.

Ultimately, the ways in which participants experienced the college choice process were gendered and it may be of interest to researchers of students' pre-college experiences and college going processes to further explore gendered dynamics of parents in the context of college going.

**Sources of post-secondary information.** Ultimately, most participants could not rely on their parents for post-secondary information. Instead, participants looked to institutional agents, namely, teachers or high school counselors to provide college-going information and support for college. The intervention of high school counselors was a defining factor in the college choice process for the participants. Many participants described individual teachers or counselors who identified them as college-bound and followed up with concrete advice they could use to apply for college. For example, one participant said talked about how his chemistry teacher understood his interests and helped him apply to college. He said:

I talked to my chemistry teacher because I was always interested in science. In eighth grade that was when I knew I wanted to do science. My chemistry teacher told me some colleges that were really good at the science. So she told me to look

into them. These are schools in California. She knew...because I would talk to her a lot...she said, 'you probably want to stay in California because it is cheaper.' So I made a list of schools that I thought looked good. I did some research to try to narrow down my list of schools.

Similarly, another participant described how his teachers introduced the steps needed to apply for college and how siblings of friends that had gone to college also provided some support. He described:

My teachers said I need to do my PSATs, SATs; I need to do these steps. I had no idea what they were though. My friends, they had older siblings that had gone to college so I looked to them for help. Then I got to high school and I was in honors classes. My grades in middle school made me eligible for honors classes in the 9th grade. From that, my teachers said you need to do this, and counselors would come and tell us how to graduate from high school. Over morning announcements, they would announce who got scholarships to what school. That was the first time I had heard of [this school]. I was like 'that's cool I want to go to [this school].'

For other students, counselors were the primary source of college going information. They were instrumental in providing participants formal and informal information about college. For example, one participant described how his counselor was supportive Latina/o students going to college and applying for prestigious institutions:

Throughout high school my counselor was very proactive. She is a 60-70 year Latina and her main goal is to increase the numbers of Latinas and Latinos in college in general. She got a hold of me and told me that I needed to get started if

I was interested in higher education and wanted to go. She told me that if I was interested in higher than [this school], I should be thinking of a Harvard degree or something of that sort. So it was after meeting with her that I got on board and on track trying to go that route.

Yet another participant described ways in which his high school counselor provided concrete information about the college application process and also tried to prepare him for the campus environment which he was about to enter that was to be much different than his home community.

I remember one of my counselors telling me that when you go to [this school]- they are going to...she wasn't discouraging me but it was more of just like for me to be prepared. She told me that it would be a lot of rich White people who will look at you and just tell you that...or only assume that you got in because you were a minority. So just be prepared.

Here, the participant relayed that his counselor was helpful to him in that she tried to prepare him for the different environment he was about to enter. After arriving at his undergraduate institution, he said: "I don't want to say it wasn't true but it wasn't as scary as she made it seem. But I definitely have gotten that vibe where it is like you have to prove yourself." This participant described that information was helpful in his adjustment to predominantly White campus. Yet another participant described his counselor going the extra mile to help him decide which college to choose. He said:

I applied here and it was not my dream school. It was not my #1. I just applied because I thought what's the worst that could happen? And initially, I was going to go to community college...but then I just got talked out of it by counselors in

my high school. And I had already gotten into so they said you're getting almost a full ride of financial aid and it's going to be stupid if you don't take that and go to community college.

It is important to note that in addition to counselors, role models and peers were also identified as sources of post-secondary information. For example, one participant described having a friend who started the college application process and encouraged him to do the same. He described:

One of my friends came up to me and she said 'I'm going to make a four-year plan with my counselor so I can make my four-year plan so that I can graduate and see if I can go to college' so I went and I did that same thing. I did go and it was a very awkward interview, I remember. She said, 'what school do you want to go to?' and I said [institution 1] and [institution 2] because those were the only schools I knew. She said 'okay, you need a 4.0 [GPA], etc.' and she basically laid out what I needed to do through high school. Then come sophomore year, I tried to get into more AP classes but I couldn't. Basically the classes I needed to get to the AP program, I hadn't fulfilled the prerequisites. So come junior year, I got into the AP program and I did the SAT and right before that I did the PSAT and I did that because my friends were doing it so I did it with them.

While most participants described limitations of the high school context in preparing them for the college choice process, some did note that they were privileged to attend high schools with a college going culture (McDonough, 1997). These schools were described as affluent or well-resourced with teachers, counselors, and administrators who cared about all students going to college. For example, one participant said:



It was called college ready. It was a teeny tiny charter school. And it was like [they] help you with English and math...we did have stuff. When it comes to my high school, when I started telling people that I was thinking of [this school], I quickly found out that 90% of the teachers were alum. And [not coming here,] that just was not going to happen with them. So I told one teacher who was not an alum, it just so happens to be. That day was their day of teacher meetings (so I was like 2<sup>nd</sup> ranked and almost everyone knew me), I guess they told one teacher who told another teacher and it spread. By the next day everyone knew that I was choosing [this school] and so every teacher was coming up to me and like was why would you do that. I was like 'I don't want to go there.' But this was before, like a week before the visit. So then I was like okay I am going.

Here, this participant describes a supportive high school environment in which teachers worked together to support students and guided this particular participant's college decision-making. Such experiences highlight differences between educational contexts that participants experienced.

**Transfer student experiences.** While most of the participants in the study were direct-entry freshman, there were some participants for whom transferring from a community college was the first step in their journey to a four-year institution. For one participant, his transfer experience was not straightforward and took him longer than he expected because he was working while also attending classes at the local community college. This participant described:

I did enroll in community college and I didn't necessarily take it serious. I was like 'yeah imma go to college, whatever. But most of the time I guess I was smoking weed, partying, working here and there. I didn't really care. I was

living life in a pleasurable way. One day...I realized that I wasn't moving forward in life and that I was stuck. I wasn't going anywhere. Every time I smoked I saw people moving forward and I was stuck at a certain time frame. It was a weird feeling. It was like a suffocating feeling, like, what am I doing with myself? I was partially going to school and partially working so I could have a balance. I noticed I was going to school and I was getting good grades. There were...people I grew up with, they would be like 'why are you going to school? You are never going to graduate.' They were pretty much telling me that. But I was like I am, actually. I was like 'don't worry I know what I am capable of doing and I know the process.' Everything is step by step. I can't just rush things...So I started looking for...people that were either smarter than me or on my level, that I could get along with.

In this participant's experience, negativity and judgment from peers were a major part of the challenges he faced at the community college level, but he kept at his education and was eventually able to transfer from community college to a four-year institution. Arguably, this participant had an even more difficult college going process because he did not have friends who were supportive in his college going efforts.

### **Chapter Summary**

The college choice processes of the participants in this study confirm much of what we know from extant literature on Latina/o educational student experiences and outcomes. Consistently, participants with immigrant parents were at a loss for post-secondary information and thus had to rely heavily on schooling agents including counselors and teachers. In many cases, participants had established themselves as high achievers in math and science and this

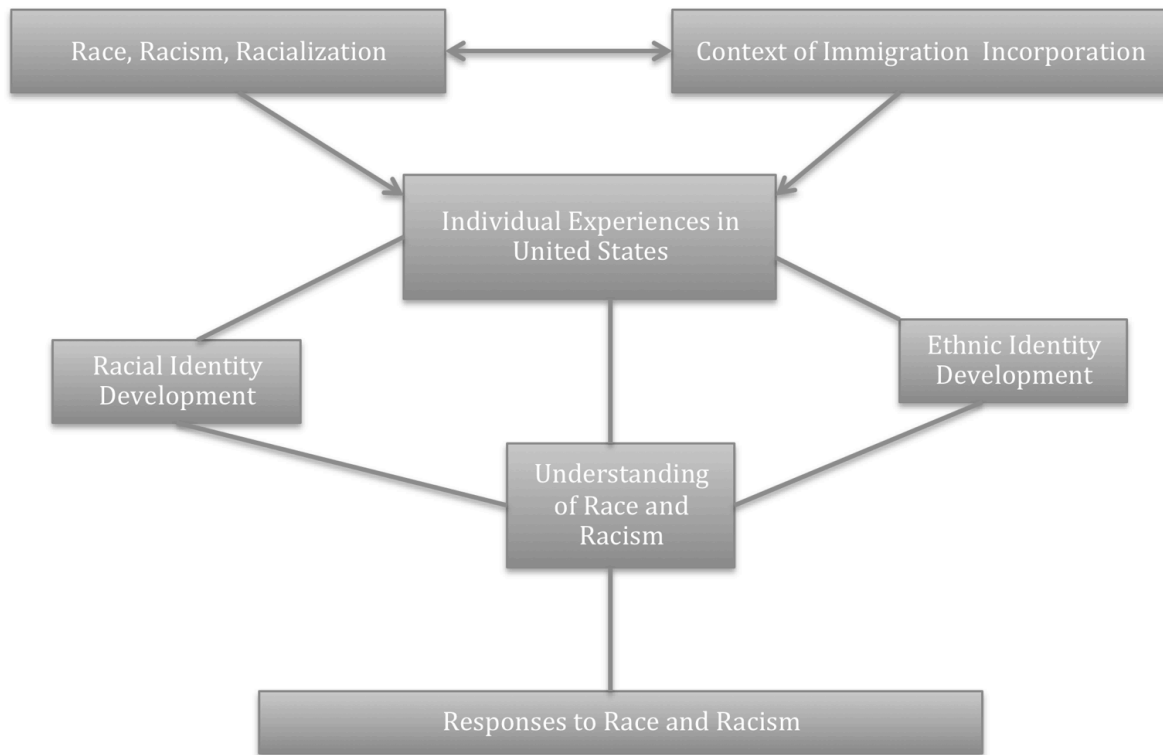
helped them stand out to teachers and counselors as students they could help with the college choice process. Such help was instrumental in providing participants with information needed to successfully gain admission to prestigious four-year institutions. Without the intervention of such key actors, participants might not have known how to apply to college, let alone two of the more prestigious four-year institutions in the state.

It is important to note that this chapter captured the experiences of 2<sup>nd</sup> generation, lower-middle income students who characterized their pre-college environments as “rough” contexts. Not all participants came from under-resourced, violent, K-12 schooling contexts. Though fewer in number, some individuals within this group of Latino men attended affluent high schools located in predominantly White neighborhoods. Interestingly, these individuals would not face challenges in accessing rigorous math and science curriculum, but difficulties in making meaning of their experiences as children of Mexican immigrant parents within environments that were hostile toward Mexicans. The implications of these experiences for ethnic identity development are the focus of the next chapter.

## **Chapter 5: Ethnic Identity And The Context Of Immigration**

How did participants understand race and racism? This chapter attempts to answer my first research question by exploring how a close proximity to an immigrant experience shaped participants' beliefs about educational opportunity and their desire to pursue an engineering degree. This chapter helps us to understand the ideological contexts that participants carried with them to college, that were fundamentally informed by participants' experiences in coming to or living in the United States. Inherent to a discussion of the relationship between immigrant generation and an individual's understanding and responses to race and racism are the interrelated constructs of racial and ethnic identity. This chapter will describe both how an immigrant context shaped participants' perceptions of opportunity as well as how participants' discussion of their ethnic and racial identities reveal important information about their understanding of race and racism.

Ethnic identity shapes and is shaped by participants' understanding of race and racism and their experiences in the United States. That is, the extent to which individuals are racialized in society (i.e. told that they present as belonging to a particular racial group and are treated in accordance with that racial groups' status within the American racial hierarchy) will inform what they believe themselves to be or identify as in terms of their race and ethnicity. Figure 2 offers a visual representation of the proposed interconnectedness of the constructs of race, racism, racialization and racial/ethnic identity.



**Figure 2.** Interconnectedness of Ethnic Identity and Racialization

Again, this chapter will focus specifically on identifying participants’ ethnic identity. That is, this chapter will identify how participants thought of themselves in terms of their “Latineness” or their ethnicity as a Latino. This chapter is divided into two main sections: the first will describe the context of immigration and how that created an ideological framework that would later be challenged by their racializing experiences in college and in other contexts. The section will describe the relationship between immigrant generation and participants’ levels of acculturation and ethnic identity development.

### **Section I: The Context of Immigration**

The majority of study participants were children of immigrants from Mexico. Participants reported limited opportunities for educational attainment for their parents, resulting in parents having little formal education inside or outside of the United States. For many of the young men

interviewed, observations of their parents working hard in the fields of Central California, picking fruits and vegetables for the greater California, would play a major role in shaping participants' desire for upward social mobility. This section will describe the immigrant experiences of participants and their families. The purpose of this section is to highlight the ways in which the context of immigration shaped participants' ideas about educational opportunity, in general, as well as their desire to pursue an engineering degree as a vehicle for upward social mobility.

**Working in the fields.** Observations of parents working hard in the fields of Central California would play a major role in shaping participants' desire for upward social mobility. Indeed, participants described their parents as working hard all of their lives so that their families could survive. Such observations were key, participants said, in shaping their desire to pursue higher education as a means of securing their own financial future and that of their families. One is immediately struck by depth of sacrifice and the strength of the parents of this group of young men. Participants relayed vivid images of their parents (and sometimes themselves) working in the hot sun, rows of vegetables, and blisters on their hands and feet. These experiences often motivated them to become successful engineers. One participant described:

When I was really young, the way my dad grew up and the way my mom grew up, they grew up working when they were really young. They grew up in Mexico. My dad went up to 6th grade so he has a 6th grade education. They would help his dad around the house where my grandfather would work. So it was after my 8th grade year, that my dad thought it would be a good experience for me to work with him in the fields. So when I was 12 or 13, my dad took me to work in the fields with him. During the first part of the summer, a lot of it was

picking *elotes* [corn], green beans. So he took me doing that. The first day, he took me and my mom so we went. I didn't like. I was really bad at it. It was hot. I was on my knees the entire day so my knees started to hurt but I didn't even pick that much. I don't even know. It was a hard job to say the least but I did continue on that summer and the following summer, he continued to take me. First, he wanted to teach me the value of money and what how difficult it even is to earn it. The second one was kinda like motivation. So my dad always told me, well my parents always told me was that education was the way out from the type of work he and my mom did. ... He always told me, 'Here, I didn't have an education so this is the type of work I'm stuck doing the rest of my life. *The only thing I can give you is show you the work that I do and how that you take from it and put more effort so you can do something different.* I'll show you what you don't want to do so take from it. Learn from it and hopefully you can do something better than what I can.' So he took me every summer even up until my freshman year in college. *Going to the fields was a really big part of me growing up.*

This participant's description of his experiences and the role it played in motivating him reflects Yosso's (2005) description of aspirational and navigational capital in that he demonstrated a resilience and desire for educational success in spite of and, to some extent, because of his parents' struggles. However, such "capitals", as they may be interpreted, appeared to be uniquely influenced by the immigrant narrative provided by parents (Portes & Rumbaut, 2001). The learning that occurred in the fields, according to this participant, taught him that higher education was a means of obtaining a better life for himself and his family. Participants who

labored alongside their parents in the blistering sun for meager wages demonstrated a deep understanding of economic hardship and the struggles of low-income communities. In light of these struggles, participants recognized how their experiences motivated them to pursue higher education. One participant stated:

[My parents] went to work in the fields from sun-up to sundown. And when I was about starting from 7 or 8 and my dad would take me to work with him...like alongside with him. At the time it looks fun. It looks like a game because you are taking the fruit off the trees and putting it into your little basket. At the time of a kid it looks fun. But when I was 15 my mom and dad would start making work alongside them and I would take my own row alongside them all by myself. This seems like a fun challenge at the time but you start noticing...even the pay it seems like for a single person after deductions it looks like a decent amount of money...but after a while you realize that the other person who is alongside near you is earning that same amount for the entire family. That is ...that is an eye-opener to understand that you could stay here and earn enough money for food and bills or you could go out and make something of yourself in college.

Yet another described:

After my sisters were born my mom stayed home so my dad was the only one working for the five of us. So working in the fields and have 5 people to support is not easy. So seeing how he would come home, all beaten up, is something that... Just seeing the cruel realities of the world I guess. Like to put food on the table...just seeing that is powerful. It was just something that opened my eyes to see what he does for a family. To think that I could do something about it...made



me push even more. I was like ‘I am going to education and I am going to try and do something for this family.’

Again, working in the fields or having parents who worked in the fields, provided students with an understanding of economic hardship and provided them with a sense of urgency with which to pursue higher education in order to provide themselves, their families, and their communities with broader employment opportunities. For other participants, their parents found work in the service sector in the United States. Participants’ descriptions of their parents’ work suggests that it was equally taxing, both physically and in terms of the time parents were forced to be away from their children. For example, a participant described his parents’ work as demanding and unstable:

My parents – they would wake up at 3 in the morning. It made me realize my dad wakes at 3, comes home like at 4 in the afternoon and on the weekend, he doesn’t just hang out, he does to work on like his side job. He does like pretty much like handy man kind of work. So I feel like that pushed me to do something more challenging. And then around the time I was applying to college like junior year, my mom had gotten laid off from her like factory job so then she was struggling to pay like little bills here and there. I was like ‘I really don’t want that. *I want to have something better.*’

Participants described their parents as having jobs that were physically taxing and not always stable. They saw college as their entry into jobs that would pay better, demand less physical labor, and provide financial security. This group of young men cared deeply about financial security, for themselves and their families, mostly because they had never had any. Their experiences were wrought with a struggle to survive and they wanted to secure

opportunities beyond what their parents had known. As one participant put it, “When both of your parents work as farmers in Mexico, anything beyond a farmer or beyond a manual labor as a professional career aspect to it is mind-blowing to them.” Upward mobility for this group of young men was, then, immediately tied to the close proximity they had to their parents’ immigrant experience and the struggles they witnessed as children of immigrants.

It is important to note not only the strong desire for upward mobility among the second generation participants, but also their awareness that their story was one that is shared among other immigrant Latino families and non-Latino immigrant groups. Participants demonstrated a desire to not only improve the lives of their immediate family but also of other Latinos. For example, one participant said:

My dad has been a mechanic since I was a little kid. My dad’s been working on cars since he was 12 and I remember going on little ride-alongs with him a lot... In my mind, I was thinking I don’t wanna be a mechanic. I wanna be something more... I wanna be a scholar. I wanna be something of school that I can look back on and not break my back working on these cars all day and night like my brothers used to... Working on Christmas nights that’s just what I saw. My dad was never home during Christmas because he was working those days. *It was unfortunate because these are the types of sacrifices a lot of the immigrant community have to make.*

This participant, and other second generation participants, demonstrated an awareness of the struggles Latino immigrant parents and their children may face in adapting to life in the United States. This ability to empathize with other children of immigrants would serve second generation participants well in college as they made friends with non-Latino children of

immigrants in their engineering programs. It wasn't uncommon for participants to recall, with tears in their eyes, the many sacrifices their parents had made for them. In describing how he got to college, one participant said:

I wanted to achieve something greater than they had and that's why my parents moved here because they wanted something more for us. I think in the back of their minds, they did want us to get an education. As much as my mom battles with herself now because I left the nest and I was the baby of the family. And that really hit her hard. She didn't know I was going to go to the other side of the nation. And I only see her 3 times a year. I don't think she would probably make that decision if she had to go back to doing that. But we've both grown a lot from it. And she understands that there are sacrifices I have to make and there's sacrifices she has to make. And I thank her internally for the sacrifices that she had to make and I think one of them is applying for that visa and she doesn't like America. She doesn't like being in the United States. All of her longtime friends are in Mexico and *she is making that sacrifice for me*. I always keep that in the back of my head and the center of my heart that I know she is making that sacrifice on a daily basis to be here to give me the opportunity to get federal aid to give me the opportunity to go to a school this nice and if I can't take advantage of that, if I can't pursue a better outcome for myself then what I might have seen in- I don't know a different world where my cousin is right now as like a baby daddy and fiend when it comes to a lot of things which includes drugs and social activities.

Indeed, participants expressed that their parents' struggles motivated them to do well in school. As one participant said: "At the end of the day if the student is motivated by watching his parents struggle and wants to do better for themselves and their family they will find a way to make it work." Ultimately, participants were very clear that their parents were the impetus for their success in engineering.

Yet, another young man described how his immigrant background motivated him to succeed but that, "as much as it is a push factor for me to do better, it is also a handicap. Even though I want to do better for myself and for them. But because my parents are not from a technical background, you are lost in the system." In other words, he understood being a child of immigrant parents was an asset, but that there were concrete ways in which he was limited by their lack of familiarity with U. S. Society, particularly in terms of access to post-secondary information (as described in the previous chapter). Ultimately, it was powerful to observe the ways in which participants internalized their parents' sacrifices and understood themselves as having a responsibility, to their parents and themselves, to pursue higher education. Participants said, unequivocally and consistently, that their parents' sacrifices would not be in vain as they planned to give back to their parents after completing their engineering degree. Definitive and heartfelt, one participant stated: "It's not that my mom expects anything from me after college, she doesn't expect me to help her. I definitely will."

**The American Dream and Immigrant Optimism.** Second generation participants believed, beyond all doubt, that the American Dream was attainable. They believed that their attainment of an engineering degree represented the culmination of their parents' dream of providing their children with a better life than they could have provided outside the United States. Some participants witnesses their parents attain a moderate level of financial security

after working for years. For these participants, their parents coming to the U. S. for a better life and actually achieving some financial stability represented the attainment of the American for their family. For example, participants described how their parents entering the United States under certain legal conditions allowed them to find work and make a living for their family. One participant said:

My dad came in during Reagan's amnesty. And then he brought my mom. Then, she got her residency in 2000. I remember going to a bunch of offices as a kid and I remember thinking that I wanted to go home and in 2000 we flew to Mexico and we came back. I'm like...now my mom tells me that we flew to Mexico that summer because a few months before that she got her residency and now we could travel...So my mom is a housewife and now she is starting to sell like Mary Kay and stuff like that, just because she has nothing to do now. She has one kid to take care of and she wants to be productive. She wants to go to school, to community college after my little brother is able to take care of himself. She has that goal in mind. My dad has been working in construction for over 10 years now. This company that he works for, he gets sent around the country. He has been all over the country- he's been to Denver, Kansas City, Las Vegas. He has been everywhere working for this company. His highest education is middle school and that was in Mexico. And the company he works in he makes really good money without a degree and he was able to buy our own house. We have our own cars. So we own. It's like with a Bachelor's degree he wants me to be making more money than he makes at the moment. Which is not going to happen for the first few years. But he makes enough money to support the family and

keep some extra. My parents are big on saving and investing so in the past they've had CDs and banks and they have...when I was doing my FAFSA for the first time, I was like Mom, do we have any savings that I need to report and she was like actually we do and she told me the number and I was like HOW have you been able to come up with this money!

Here, this participant described how his parents were able to work hard and attain some financial security. Their parents' ability to save and become home owners represented the attainment of the American Dream. This participant acknowledged that his parents' entry into the U. S. was shaped prevailing immigration policy and that these policies have shifted over time, limiting access for other Latinos. Indeed, some participants demonstrated awareness that Latinos have been differentially affected by immigration policy, making entry to the United States comparatively more difficult for Latinos than for other groups. Participants who shared this knowledge seemed to allude to a broader understanding of ways in which policies differentially shaped the lives of Latinos as a racialized group.

While some participants described their family as having achieved the American dream, one participant witnessed a harsh reality when his parent, who had worked in a factory for over 20 years, had been promised a scholarship in the amount of \$2,000 for his children but when it was time for them to graduate high school and benefit from the scholarship, the company terminated the program. This participant described seeing his father crushed by the news that after "giving his life" to the company, he still would not be able to help subsidize his children's education. He described this experience:

So in my mind I was always going to work hard because it would help me, they were going to give me a scholarship. It wasn't supposed to be a big scholarship. I found out it was a \$1,000 scholarship. But they ended up cancelling that program the year I graduated. So I didn't get anything. I felt ripped off. Only because you know it was my dad's dream that he would help me. He worked at that factory for 20 years you know and it was good that they could help me. That scholarship was for the kids and they just got out of it the year I graduated. So my younger brother and my younger sister didn't get anything as well. It would have been something. They were promising my father and that is what pissed me off the most. My dad worked there, even though he is now a supervisor, he worked on the line, he worked with his hands and *he dedicated 20 long years of his life to that factory*. I think most Hispanic parents do stress education but they can't afford to send their kids to college and then it is just *how do they get there?*

Although this participant's dream and those of his parents were shattered at the loss of this opportunity, he continued to believe that his hard work in engineering would eventually allow him to give back to his family. Thus, though somewhat disillusioned by his family's experience, this participant maintained a faith in his ability to acquire the American dream for himself and his family. This experience could have been an example of a case in which poor and radicalized communities can lose trust in social institutions and promises of the American dream, though this participant was resilient and did not let the loss of this scholarship deter him from going to college.

For the children of immigrants in this study, the idea of working toward the American dream functioned as a narrative that helped promote their desire to achieve educationally. This,

and other immigrant narratives, helps to explain observed disparities between children of immigrants and later generation radicalized minorities (Portes & Rumbaut, 2001). Immigrant optimism, or the belief that one can be upwardly mobile in society based on meritocratic ideas about opportunity in the United States. This optimism has been identified as a contributing factor in the success of children of immigrants in sociological literature (Portes & Rumbaut, 2001). Indeed, all of the second generation participants were asked to identify of immigrant generation in shaping their educational success and across the board, participants said that it served as a motivation for them to succeed. They understood that their parents had immigrated to the United States to provide them, specifically, with educational opportunities and it was thus their main purpose to become educationally successful. That participants drew on the optimism that they could succeed because their parents had immigrated for this purpose was a key factor in their educational trajectories. Also, sometimes parents were able to reference particular narratives regarding their family history outside of the United States. For example, participants told stories of their parents being educated outside the United States and how they had become successful, even if that success did not carry over to their experience in America. Other times participants described positive legacies that their family left behind in their country of origin. For example, one participant said of the influence his second generation status has had on his educational journey:

Yeah it makes me a little more adventurous I guess. I guess as reference, my dad, where he is from...his dad was the only dentist in the state that we lived in. So he was the only doctor, dentist. So they were pretty well off. But even then my dad still decided to go to the United States. He could have been pretty well off if he had decided to stay, but he left anyway and I always thought that was pretty cool



what my dad did. To just not take the easy route and start his own thing from scratch. I've seen the pros and cons of that. It made me feel like I am not trapped. Like if I wanted to go and leave a country, I could leave a country. Which is nice. Then in terms of my mom, she didn't want to leave but now that she is here...because she like had to restart her career...the fact that I saw how far she has gone from where she started, it made me appreciate the American dream, it does exist. Which is kinda nice. *It makes me think that anything is possible.*

The purpose of this section was to highlight the educational and ideological contexts that shape student trajectories in engineering. Immigrant generation or proximity to a recent immigrant experience helps us to understand that immigrant generation brings with it a certain ideological context for navigating U. S. social institutions. Sociologists refer to this as an “immigrant optimism” that promotes success of children of immigrants. Yosso (2006) refers to this as “navigational capital,” or the skills by which individuals make their way through institutions characterized by a legacy of racial discrimination. Here, a close proximity to an immigrant experience was critical to academic success. Positive perceptions of educational opportunity- namely that it exists and that they are eligible for participation- was key to the pursuit of engineering for this group of young men. Belief in engineering as a means up upward mobility was fundamentally informed by an immigrant trajectory. Ultimately, one participant's statement sums up well the ways in which participants felt they were essentially blessed by a burden; motivated by, but at the same time, threatened by their struggles: *“The culture that I come from has both motivated me and both held me back in things that I don't fully understand or fully comprehend.”*

While children of immigrant parents were motivated to effect change within their families and, sometimes, the broader Latino community, later generation Latinos seems to envision the possibility of societal change more broadly. One participant described how, because of his later generation status (and accompanying lack of ethnic raw materials), he felt he did not fully belong to the Latino community. In spite of feeling somewhat outside of the Latino community, he was motivated to improve educational opportunities for Latinos based on his observations of the struggles of Latino peers. I called this desire for broader social transformation a “transformational impetus.” This concept will be further developed and discussed as a response to race and racism in engineering, the focus of Chapter 7: Responding to racialization, race, and racism. The following section will describe further participants’ cultural contexts and the relationship between their immigrant generation and racial/ethnic identity development.

## **Section II: Ethnic Identity as a Context for Participants’ Understanding of Race and Racism**

This section identifies how participants thought of themselves in terms of their ethnic identity. By utilizing a physio-social ecological framework, we can observe that as participants moved through various social contexts, they were prescribed a racialized ethnic identity as Latino. That is, they were racialized as Latino and therefore perceived as belonging to this particular racialized ethnic group. Thus, although race and ethnicity are distinct constructs, Latino is simultaneously a racial category that individual may be assigned based on their phenotypic appearance, and an ethnic identity that individuals may be prescribed or claim for themselves based on their cultural heritage. At times, the ethnic identity participants claimed for themselves was at odds with how others perceived them. How participants talked about ethnic identity shed light on how they understood race and racism.

**Self-identification.** A criteria for participation in this study was that individuals must be “Latino, Hispanic, or Chicano and be of Mexican or Central American descent” but participants did not need to identify as such. In fact, as described in the methods chapter of this dissertation, participants were recruited based on their identification with the campus registrar’s office as Latino. In other words, students who were designated as Latino within campus records were recruited for the study, even if they did not necessarily claim this identity for themselves. Although all acknowledged that they were Latino and understood others’ categorization of them as such, some later generation students and highly acculturated children of immigrants described the limitations of this term in capturing their individual experiences. Indeed, it would turn out to be the case that this term proved inadequate for some participants. When asked to identify the term he uses to describe his racial/ethnic identity, one participant offer his own term:

I would say *I am a modern Latino*. Not like Latino, speak Spanish ...I am a modern Latino. My definition of Modern Latino is that you were born in American and you come from a Hispanic background but you are not as assimilated into that Hispanic origin. You are more assimilated into what the US has brought, what is offered to you here and now. Not what was given by your parents and what your parents experienced. When you think about someone who speaks Spanish you think of someone who speaks Spanish and is maybe from a Latin country. My definition of Latino is you have come from a country of Latino origin and spoke the language and are really diving into your culture. You know who you are as a Latino, Columbian, or Ecuadorian. *You know who you are*. And for me I do not have a close tie to Mexico because I am very loosely tied to that. I am more like I eat the cuisine and I understand some Spanish but I don’t speak it

...Being from that country is not salient. A lot of people that I have met that I believe are Latino. *They take a lot of pride in their country that they come from or that their families come from.* I am like oh wow that is great. *I am not like that.*

Participants offered descriptions of themselves (e. g. Modern Latino) that reflected the extent to which they had been acculturated to American society and the degree of connection they felt with their ethnic group. The participant who offered this particular view of himself as a “Modern Latino” explained that he cannot associate fully with the term Latino because it implies a connection to a country besides the United States, which he did not have. Furthermore, he posited that Latino assumes some level of ethnic belonging, which he as a later generation participant, also did not have. Thus, this participant felt that his term more appropriately reflected both his experience of being a later generation person of Mexican descent living in the United States and his perceived limited connection with co-ethnics. Overall, later generation participants (3<sup>rd</sup> generation and later) shared similar experiences in which they felt different than more ethnically identified Latinos because they were far removed from the immigrant experience and less connection to Mexican or Central American culture.

Some participants, (most of the 6 later generation Latinos and some 2<sup>nd</sup> generation Latinos) were highly acculturated and lacked what sociologists call “ethnic raw materials” such as the ability to speak Spanish and knowledge of cultural practices associated with an ethnic group. In other words, while early immigrant generations (1. 5 and 2<sup>nd</sup> generations) did have a higher degree of ethnic sense of belonging, some were more acculturated and their experiences closely mirrored those of their later generation counterparts. In general, early generation participants possessed a greater sense of belonging to the Latino community than did later generation

participants but immigrant generation did not inherently dictate levels of acculturation and ethnic belonging. For example one participant, who born in Mexico came to the United States as a young child, described himself as highly acculturated into American culture-so much so that he was teased by his family and friends for being “Whitewashed.” He said of being teased:

I am used to it by now, especially from my younger sister. She said I am very Whitewashed. I guess since my sister and I listen to music, I’ll listen more to English music and she will listen to more Mexican-type music. And I won’t know that many Latino anything too much. And she is like, ‘why don’t you?’ She was born here. I guess she wants to be looked at as more Latino, so she wants more. But I’m like ‘Hey, this is where I grew up.’ This is what I was surrounded by. I guess it also seemed like most of my friends were 1.5 or born here so we were all on level ground growing up. So anything starting emerging, we went along with it, with the American culture. I guess my sister...I don't know. She says with my speech, she says it’s very White. I’m like ‘what does that mean? What does that mean!?’ She told me that the easiest way to explain it is that if we were on the phone and I didn't know what you looked like and you were just talking to me, I would think you were White. Why? She was like ‘I don't know just the way you speak, your attitude, your grammar.’ Believe it or not, apparently. I was like ‘okay.’ And she isn’t the only one I’ve gotten this from. I’ve gotten it from one of my coworkers...she was also Mexican but she was born here. She is like my sister. She said ‘you are a coconut.’ I was like, ‘what does that mean?’ and she was like, ‘*you are brown on the outside but you are very White on the inside.*’ I was like ‘Oh. Okay. I don't like that very much,

that you think that. ' I guess it's not really about...it's not my fault most of my teachers were White when I was growing up. I just copied who was teaching me. It was bound to be. I was like 'whatever. If you want to say stuff...' But one of my cousins, he actually married an American White girl. And she told me 'dude, you speak Whiter than me. ' That is just depressing. Apparently! Apparently speaking grammatically correct means 'Whiter'. I am like 'no, no this is weird. ' Even my mom called me that one time. I was like 'oh my God, how do you know this term?!'

This participant's experience of being called a "coconut" or accused of "acting White" by members of his own racial/ethnic group are common among those who are presumed to not be "authentically Mexican. " Again, this was much more common among later generation participants but it was also true for some with a more recent immigrant experience, as was the case for this participant. Such experiences across immigrant generation laid a foundation for participants' understanding of race and racism. Experiences taught this individual that he would be seen as a member of a racial/ethnic group, and his behaviors and practices would be judged in accordance with his prescribed membership to that group. Thus, before coming to college, participants understood themselves as racialized within an American societal context, and this had implications for the extent to which this group of young men felt like they belonged within the Latino community. This particular participant would later talk about finding other 1.5 and 2<sup>nd</sup> generation "coconuts" like himself in college and building community with them, while later generations would describe the negative consequences associated with their presumed ethnic inauthenticity.

**Perceptions of Latinos.** In speaking to the salience of immigrant generation in their experience, 1. 5 and 2<sup>nd</sup> generation participants said that their immigrant generation was salient insofar as it served as a reminder of where they came from, where their parents came from, and formed the basis for their educational aspirations. Participants described Latinos, based in large part of what they observed of their parents and within their home communities, as having a strong work ethic. Many shared the sentiment of one participant who said: “I know we are known as hard workers, in the sense that Mexicans, a lot of Mexicans from Fresno work in the fields. A lot of Mexicans in Fresno are custodians, mow lawns and are hard workers. They bust their ass every day all for minimum wage. I would take that same work ethic and apply it to my career or you know I might not be the best engineer but I am definitely going to bust my ass every day at what I do. That is the work ethic that was implemented that I saw my parents show.” Despite expressing great pride in their ethnic identity growing up, participants also expressed that within their communities, there were and are divisions between immigrant and non-immigrant Latino populations. Some participants relayed negative perceptions of other Latinos: later generations expressed concern that immigrant populations don't work as hard while children of immigrants expressed the same concern about their later generation counterparts.

Interestingly, participants perceived conflict between early and later generation (immigrant and nonimmigrant) Latinos. The data suggests that study participants, regardless of immigrant generation, were racialized in the same ways but they ways, that is, unequivocally, participants were presumed to be Latino, specifically, *Latino immigrants*. Yet, participants' interpretation of that experience was shaped by their ethnic belonging and desire to be seen as Latino. In other words, some participants resented being associated with immigrant Latinos and

others resented the association with the term Chicano or later generations. For example, one participant expressed a frustration with Chicanos:

There was a division because there were people who were from Mexico like myself, just directly from Mexico who were hardworking... We worked harder because we knew there was going to be a barrier later on. The Dream Act was like back in the days. It was still in its developmental stages. We couldn't really rely on that. We knew that regardless of how hard we tried, there was still going to be something that held us back which was our legal status. For the Chicanos...who had a greater level of opportunity for success because they could at least make it through the door. My cousins for example, some of my cousins who were all born here, I would always talk to them about things that I've been doing in school and how cool this was...He is a year younger than me and he is still kinda doing the same thing, still wavering and he's had a lot of troubles within the household but he never tried to widen himself at school never more than going to gym class. He was concerned with his social life.

Here, this participant points out that immigrant status bears the added challenge of documentation. Given that Chicanos don't have to worry about citizenship issues, he expressed, one might think they would work hard and demonstrate greater levels of educational achievement. This perception that barriers to education and social mobility in society can be overcome through hard work reflects some of the meritocratic ideals upheld by 1.5 and 2<sup>nd</sup> generation participants. This particular participant demonstrates an internalization of narratives of opportunity in America and directs those beliefs at his later generation counterparts, who he believes should work harder. Interestingly, in describing their pre-college educational



experiences, participants demonstrated an awareness of schooling practices that negatively influenced their experiences and those of other Latinos, but in talking more broadly about opportunity, participants sometimes placed blame on early or later generation counterparts. In talking about educational opportunity in general, early generation participants assumed that their later generation counterparts had limited barriers to educational opportunity: "Other people know their way around the system in a way. It just goes back to SATs and stuff like that. My parents didn't know anything about that. It was something I had to learn. I guess that extends to anything else. Maybe it is unique to here, living in the United States. Not necessarily first generation college students and they have an understanding of the college experience." This particular participant, like others, asserted that later generation Latinos had not excuses for not doing well in school. Yet another young man stated:

So when your own people are making fun of you in the lunch line, thinking that you don't understand Spanish is very insulting. My perception of being Mexican is that I am proud to be Mexican because of the work ethic that comes along with it. what it means to me is different what it meant to other students in high school. They would use it as an excuse not to do their work. In my mind, just because you are Mexican, doesn't mean you should be failing. If you were Mexican, you would show your work ethic and you would show people. I think it is contagious like amongst other minorities- if you are told you cannot succeed you are going to buy into it. you can use it as an excuse. I have gotten to the point where I don't buy into excuses. There really isn't an excuse for anything. I am not going to say that you fail on your own or you succeed on your own, but if you really want something you go for it and there really are no excuses. You can make excuses if

you want but if there is something in your control- I know you don't control your race or ethnicity. But you can control by looking for help or looking for someone to help you. I think even though there is an excuse for everything, it is not good enough. There is not ever an excuse good enough.

This participant expressed frustration that his co-ethnic peers acted out in negative ways whereas he chose to counter negative stereotypes about intellectual ability among Mexicans. He viewed his expression of his ethnic identity as being different than that of other in that he refuses to let his opportunities be defined by others' negative views of him. Stereotypes appear to have been internalized in such a way that, as participants said these stereotypes were not true for them, they sometimes positioned them elsewhere within the Latino community. In other words, participants seemed to reject stereotypes at a more local level but did not reject them as being untrue for the entire community. That participants did not outright reject negative stereotypes altogether demonstrates the pervasiveness of the demonization of Latinos- negative images are internalized and reproduced within the community. Several participants described being teased by members of the "opposite" immigrant generation or group for being too Mexican or not Mexican enough. One participant stated:

Like from high school on to this day, I have always had a lot of White friends. A lot of my friends have always been White. I don't know. It hasn't been a struggle but my family they make fun of me. They are just like "you are our White kid." Stuff like that. It doesn't affect me but it definitely bothers me that they have a problem with it. They jokingly have a problem with it but I know they have some sort of secret hidden meaning behind it. I don't know why they tease me. It is kinda a social problem I would say.

Again, immigrant generation did not emerge as a salient social identity but it was relevant to participants' perceptions of opportunity in America and the position of Latinos within that landscape. One participant, who came to the United States as a child, said of immigrant generation:

I think it does matter to a certain extent. When you come from a 1.5 generation like me you have to progress socially and climb the economic and social ladder. That is kinda what we did because when we came here it wasn't the best conditions. Anyway, we have been through a lot so we have kind of made it so what I have to do is, I don't want to end up like people in the streets or someone who makes a half attempt at everything. After everything you have been through you want to have the most bang for the buck. That is where the self-motivation comes from. Now people from later generations may have the self-motivation from their grandparents and they may be inspired by those stories but that is a little more uncommon. They may be also still inspired by their parents. Maybe they are in a more stable condition. Maybe they haven't been through as much but maybe they still have the self-motivation because they have friends or know other people who are in a worse state than they are and they don't want to end up like them. And people in higher immigrant generations who are more stable conditions they might still have self-motivation like I did because they really love their field. They want to succeed and it is their dream. All those three scenarios could equate to the self-motivation that a 1.5 generation. But I feel like in my case and in people similar to my case, I feel that it is a little more natural. Now in the other cases that can also happen, but it is not as common.

While 1.5 and 2<sup>nd</sup> generation immigrant students had opinions about the later generation counterparts, so too did the later generation participants have of those with a more recent immigrant experience. For example, when asked a follow up question of whether he believed that there are differences in terms of work ethic between immigrant generations, one participant said:

There is truth to that. The people that identified as less Latino, they actually worked a lot harder to get to where they are. Those were don't culturally identify themselves as more Latino... Yeah the more modern people, they worked harder. That confused me because I would think that the people who are more Latino-Latino who came from Mexico and are now getting these opportunities and stuff like that that they would work harder. But I guess in my case at my high school, that wasn't the case. That was really concerning to me because I was like 'you have so much going for you and you could just take advantage of what is here and use it to your advantage' but those people didn't realize that or didn't do that.

When asked to clarify: "So the more modern or Americanized ones that worked harder?" this participant said:

Yeah, they were more active and pushed themselves to do more. It was really confusing to me, honestly. I would think that if you are here in America to have a better life and your parents came here to give you a better life. I mean, obviously they came here for a reason either for work purposes or just to live a better life, maybe. And with that comes our education system. And our education system can provide for you. Why not take advantage of what you have? Honestly, it doesn't matter how bad it might be, take as much from it as you can. Even

though it might not be the greatest education it is still something. You can still make something out of what little is given.

Ultimately, early generations held negative perceptions of later generations, and vice-versa. This can, at least in part, be explained by the colonial nature of contemporary race relations. That is, as a racialized minority group, individuals often internalize negative perceptions about themselves and, through prolonged exposure to the colonial project, begin to project these beliefs onto their own communities. This is an unfortunate reality that was evidenced by statements made by some participants. However, it should not be assumed that these young men were simply victims, and in their own right, oppressors. On the contrary, participants were engaged in an ongoing process of trying to make sense of the world and their place in it. As they navigated multiple contexts and were prescribed identities based on established racial hierarchies, they adjusted their perceptions of themselves. Their subjective experiences were complicated and reflected their traversal of intricate and endlessly complex ecologies.

### **Chapter Summary**

This chapter has described two major theme areas within the data collected from interviews with Latino engineering students. First, I described participants' collective proximity to an immigrant experience and how that impressed upon them particular narratives about opportunity in America. In the second section, we saw how those narratives were expressed through participants' perceptions of their Latino counterparts, particular in the context of post-secondary educational attainment. Participants had strong feelings about why or why not Latinos, as a whole, are academically successful. This can be understood in terms of the prevalence of negative stereotypes about Latinos, particularly about intellectual ability and laziness. Their ideas represented negative stereotypes of Latinos. Whatever the extent to which those

stereotypes were internalized, they appeared to inform how participants viewed themselves in terms of their racial and ethnic identity. This chapter an example of a label that one participant used instead of the term Latino. Subsequent chapters will continue to build on these ideas, particularly as these narratives and participants' ethnic identity informed both understanding and responses to race and racism.

## **Chapter 6: Race And Racism In The College Context**

While previous chapters focused on describing participants' pre-college experiences and contexts, this chapter will describe participants' experiences in the broader campus environment and within the engineering context. This chapter will demonstrate that pre-college experiences and contexts primed participants' understanding of the stratification of educational opportunities they would come to observe in college. Although they would assert the primacy of social class in shaping educational opportunity and deny the role of race and/or racism in shaping their experiences, their experiences in the college context provide evidence to the contrary. Indeed, this chapter relays findings characterized by contraction between participants' stated beliefs about race and racism and their experiences. What emerges from this part of the story of this talented and resilient group of young men is that all were faced with the same ugly beast of racialization, but their descriptions of the nature of that beast were much more illustrative, vivid, and varied than we have previously captured in extant literature. Such depictions of the beast, or the nature of race and racism, would have dramatic implications for how they would fight back. The purpose of this chapter is to illustrate more fully a scene in which our protagonists confront the inevitable: racialization in the college context.

### **Section I: Racialization in the College Context**

Racialization refers to the process by which individuals are prescribed a social identity based on a racial hierarchy in American society. Race, as a construct, refers to the product of such racialization processes, or the resultant category prescribed to an individual based on physical, cultural, or other attributes. Racism is a terms used to describe prejudice and discrimination directed toward individuals and/or groups based on their prescribed affiliation with a racial category. This section will focus on understanding *how participants were*

*racialized in college* by describing the specific experiences that contributed to their understanding of themselves as members of a racialized ethnic group. In exploring participants' experiences with being racialized (or prescribed a racialized ethnic identity) we further develop an understanding of their experiences with race and racism. That is, our concern is not in establishing that they are racialized. This is a given assumption of the guiding theoretical framework employed in this study. Rather, our concern is with understanding participants' views of race and racism as they encounter a given process of racialization. On the surface, participants' experiences with race and racism in the college context resemble much of what we know about student transition and campus climate literature. However, a closer look at these experiences reveals important differences in subjective experiences with race and racism that require us to more fully consider the heterogeneity of a student population for whom we have assumed a uniform experience.

**Culture shock.** Upon arriving on campus, participants described being immediately struck by socioeconomic privilege of peers. This was true of almost all participants from lower-middle socioeconomic backgrounds. The idea of "culture shock," defined as incongruence with a student's home community and the college campus (Rendon, 1994) has been identified as a common experience for low-income students of color selective four-year institutions in extant research literature. One participant described:

Since I went to elementary school in LA, which was predominately Latino, I didn't really experience anything. When I got here there was a culture shock. You don't really know how to adjust to it at first. Your household is obviously different than their household. So you have different experiences and so you can't really relate to them like that...them meaning those who are not Latino. And I



don't mean that as people who are not Latino are different but I always. . . it is easier to gravitate toward people who are more like you. So that is easier to establish that sort of connection. It took a while to adjust to it. . . I just figured I had to adapt to it. Here it wasn't just culture it was the difference in financial status. People have things that you have had or even dreamed of having. And for a lot of them, their parents went to school. And my mom would never be able to afford like what they have here. Well even now the shock is still intimidating that you are a select few in your classes. In a way that puts some pressure. It is not that I can't deal with it but you know it is there. You want to succeed in life. I mean financially I have never seen that kind of money being flaunted everywhere.

This participant's experience of being shocked by the stark differences between his home community and the college environment is representative of what other participants described.

The root of this shock was the limited number of peers of a similar racial/ethnic and socioeconomic background. This young man, and other parents with working class parents, described being floored by financial resources of peers. Overcoming this initial shock represented a primary challenge for participants who were attending highly selective institutions:

Well, leaving home [was my biggest challenge]. I know it is a common thing to deal with but just knowing my mom had this sentimental feeling about me moving away... the fact that she thought I was never going to come back to home, things like that. So I guess the challenges were that I always felt that I was not prepared well enough by my high school for a school like this. This is a lot more selective school. All of my friends had 2000 or 21000 SAT scores- that or above. I had like a 1700. I thought that maybe I am not as adequate as they are. But you

know, coming from a school where you are in the top 5%- you have that feeling of like how am I going to do in this school? Another challenge was just finding people to identify with. I mean, *a lot of people I was interacting with at my speed were usually well off. They didn't really have any challenges*, I guess. So, I get people complain about that and I just try not to anymore. We live in two different worlds, we can't compare. I always thought I was middle class until I learned I was actually lower class. I learned that when I started applying to colleges. It is actually something that I realized. You have to realize where you are coming from. I had to realize that I was not middle class I was actually low-income, minority basically. So I guess some of the challenges were just identifying with people. I always try to find people from the same high school because the majority was not Hispanic.

Like many others, this participant described how he felt that he and peers he met on campus lived in “two different worlds.” He described coming to the realization that he was “lower class” as he was entered a world of extreme affluence. Within this context, this participant went on to share a story in which a friend lost a scholarship, and as a result, another friend simply called his father to foot the additional tuition bill. This participant described how he was amazed that with a simple phone call, his friend solved his financial problem and got the money to pay for school. Such was the level of wealth he was surrounded by. Individuals he encountered “really didn’t have any challenges” because they could buy their way out of problems, and if they couldn’t, they were connected with others with important resources at their disposal. Although participants exhibited the culture shock previously defined in extant literature on Latino college students, *it is also important to note that participants were not simply “shocked” and*

*subsequently “challenged” by a lack of racial/ethnic and socioeconomic diversity. They were keenly aware that differences between themselves and peers bore differential access to educational opportunities.* Thus, participants were not only challenged by the individual academic and social consequences of not having peers with whom they could connect (identified as a primary consequence of lack of structural diversity identified in extant literature), but they were also concerned about the concrete advantages of peers that would directly influence their own academic achievement within a highly selective institution and the competitive field of engineering.

**Perceptions of Privilege: Capital Shock?** That participants experienced a culture shock when they arrived at a highly selective institution and found few peers with whom they could connect might be expected given that this has been previously documented in extant research. Interviews from this study suggest, more specifically, that participants were not only shocked by vast differences between themselves and others and challenged to find connection but that they were also shocked and challenged to know for a fact that others would be afforded concrete advantages as a result of their socioeconomic and racial privileges. *Participants consistently and emphatically asserted that when more affluent peers were able to draw on resources associated with their socioeconomic status (e. g. pre-college access to tutoring and other academic resources, rigorous high school curriculum in math and science, being able to ask parents, who are engineers themselves, for help with course content or about differences between engineering subfields, etc. ), and that this had direct consequences for their grade in a given class.* They were not as much concerned with lack of social support or feelings of isolation as they were with the proliferation of opportunity their selective institution and engineering departments provided to more economically advantaged peers. For example, one participant stated:

A lot of people in my classes- *their parents were engineers and I am just like, 'wow that it is great for you. ' They are going to have jobs lined up for them when they graduate and I am like, 'wow that must be nice. ' It is just more of a struggle for me at least because I know I have to work twice as hard because of that. The kids in these classes are getting spoon-fed for things because their parents help them out. I literally had to start from scratch and they knew people from the get go. I knew it was going to happen but it's just more of an eye opener that I need to work pretty hard to get where I need to go.*

Participants frequently shared their perception that the occupation of peers' parents provided them advantages, particularly for those whose parents were engineers. Consistently participants said things like this in comparing the advantages their parents could provide to those of peers: "It is definitely... as much as it is a push factor for me to do better, it is also a handicap. Even though I want to do better for myself and for them. *But because my parents are not from a technical background, you are lost in the system.* " Participants noted the existence of a "system" in which those with greater socioeconomic resources had better access to educational opportunity. Again and again, participants said:

A lot of people come from parents who were engineers that know calculus. Like me, I didn't really have that experience. So a lot of kids are just flying by the software classes stuff like that, having just a good time pretty much. I'm like staying up late at night up until 6 in the morning trying to figure out how this is working. It was pretty tough adjusting into engineering coming from a high school that didn't really prepare you for that. I knew physics in high school but engineering classes in college are different, you know? You have like software

you have to learn. You have to get good with excel. I never ever used excel until freshman year. I'm really good at it now because where I worked, all I used was excel. But some of these kids, they got tutoring. They got like experience in high school where you're walked through easy stuff like that.

Such statements demonstrated that participants were aware of the interconnectedness between social class, socioeconomic status, and educational advantage. Such awareness seemed to be informed, at least partly, by pre-college educational experiences that sensitized participants to educational disparities (described in the Chapter 4). What emerged from conversations with study participants regarding their initial perceptions of the campus climate was that they not only suffered the well-documented, negative consequences associated with adjustment and persistence for students for color, but that they felt directly disadvantaged by the advantages of more affluent, White peers. In describing the campus environment, broadly, participants invariably cited the overwhelming socioeconomic privileges of peers as a primary challenge to overcome. Participants, again, were aware that socioeconomic background would play a direct role in their experiences and directly shape educational outcomes. For example, one participant described having a friend who had greater access to educational resources that shaped his post-secondary opportunities. He also pointed out how educational advantage directly shaped his ability to compete at a prestigious institution. He recalled:

I knew a Hispanic male that was a year older than me who was very enthusiastic about engineering. His father was a White and his mother was second generation Hispanic. So he did identify as Latino even though we he was a bit more assimilated than most. His family is like Caucasian but he grew up with mother so he kinda identified with his mother. He ended up getting accepted to the

University of Pennsylvania as a mechanical engineer. *So in my mind if I followed his footsteps I would have been able to Penn as a mechanical engineer even though I didn't know what a mechanical engineer was and I didn't know that is what I wanted to do.* I applied as an engineer there and Berkeley, San Diego, Stanford, and Penn. And of course I didn't know how competitive engineering was. And my scores were really low, they were average. So I ended up getting waitlisted at Stanford and UPenn. I ended up getting accepted [here]...and I was content where I ended up...especially after I found out how difficult engineering is. *I was happy I was here rather than Stanford or another school or maybe I wouldn't be able to be as successful and I wouldn't be able to compete with the other students because of their educational background, kids who had higher educational backgrounds, went to private schools, or maybe had parents who were engineers, or grandparents who were engineers and stuff.*

In describing their culture shock upon arriving to highly selective institutions, participants noted stark differences between themselves and peers in terms of socioeconomic and racial/ethnic background. They seemed to describe coming to the realization that despite their enthusiasm, talent, intelligence, and strong desire to pursue engineering, there were concrete ways in which peers were advantaged and that such advantages directly disadvantaged them because of the competitive grading structure of engineering and nature of a highly selective institution. As the previous quote demonstrates, participants feared that they would not be successful because the “system” of higher education privileges those who have had the requisite “training” or forms of social and cultural capital. This particular participant points out that he is glad he was not admitted to what he perceived to be more prestigious institutions because he felt that within

those contexts he might not have been able to compete. Again, it is important to emphasize that participants acknowledged the privileges of peers and that they were forced to navigate an environment/system that was not only “isolating” and “different” but directly working toward their disadvantage. One participant stated:

[You ask yourself:] ‘all right this is going to have a factor to play in my midterm?’ Which will have a factor to play in my grade in the class, which will then have a factor to play in my GPA, which will affect whether or not I get an internship, which will help determine what I do after school. In fact, what is it exactly that I wanna do once I graduate? It’s all of these questions that people would have otherwise already known since they were like little kids. *There are people here who knew they wanted to be an engineer since they seen their dad leave for work every morning.* The only aerospace company that I knew when I was a little kid was NASA. That was it and that was just from stuff we saw all over the place but unfortunately not enough. It was just basic generic things. *I think it’s just because we’re new to the playing field. We’re new to the ballgame. We’re the Jackie Robinsons of engineering right now. There’s nothing we can really ask to do right now but to push ourselves forward beyond all of these drawbacks we might have and continue to keep your chin up despite as many as you fail.* It’s a lot of what you learn in engineering. You’ll continue to fail.

This participant believed that Latinos were the “Jackie Robinsons” of engineering in that they are the minority trying to break through engineering. Participants demonstrated a deep understanding that they as individuals were in a context or field in which others were equipped with the resources and tools necessary to compete and that they were without these same tools (Bourdieu & Passeron, 1990; McDonough, 1997; McDonough & Nunez, 2007). Furthermore, they understood that not having such tools would require much greater effort on their part to succeed and that such expenditure in time and energy would directly influence their academic success as engineering students (Dika & Singh, 2002; Mahar et al., 1990; McDonough & Nunez, 2007; Swartz, 1998). Participants’ descriptions of their college environment were not that they were inherently lacking skills, motivation, drive, talent, intellect but that *others* possessed resources that they could strategically employ to their benefit.

The importance of these findings regarding Latino engineering students’ perceptions of privilege cannot be understated for three very specific reasons. First, such findings demonstrate that a Bourdieuan framework of social and cultural capital may be *preferable* to the increasingly popular Community Cultural Wealth model proposed by Yosso (2005) for exploring educational inequities for students of color because it allows us to demonstrate ongoing educational disparities in access to concrete, valuable, and material forms of capital that are valued in an educational context (i.e. field), and require institution and societal intervention to redress. Secondly, and perhaps more importantly, participant’ discussion of privilege in the campus environment involved them asserting the primacy of social class in shaping their experiences rather than race, yet as we will observe in subsequent sections, race and racism very much played a role in their experiences.



This study provided evidence that participants observed Bourdieuan notions of capital rather than that of Yosso. They relayed that peers from wealthier backgrounds than their own accessed academic, social, and cultural capital. Their primary and immediate challenge in the college context was that others had the requisite forms of capital to succeed in the given field of a highly selective institution. Participants acknowledged that their families provided them with forms of capital but also recognized that the forms of capital valued in their given field were held by more affluent, White peers as evidenced by this participant's story:

Not really. I think, I don't know, this guy I knew. It was an interesting story. I told this guy how I always used to ask my parents why don't we go on a camping trip or something like that. I told him how I always wished for a camping trip when I was younger and always wished I had that RV experience or just going out. My mom was really sick so she couldn't go out so for the majority of my childhood, so we couldn't go hiking or go out on a horse. I would always tell her that I wish we could go out on a trip or go somewhere cool. I wish we could go to a theme park or something like that. I was telling my friends: oh you must be so lucky because you can just take a trip to Italy or you can go to Africa and do all these cool things! I told my friend this story...This is kinda funny and I don't know if I should keep this off the record. But one time me and my parents were going to this field and we were taking peaches from the farmers. We had a truck full of peaches. I didn't think about this at the time but technically were stealing peaches. We were going to get thrown out either way. We pulled up and we had a lot of peaches. We saw one of the farm workers so we just took off. It was a cool experience. My friend was like, you may not of had those experiences, like

going camping. But you had that experience. That experience with your parents.

You had that. It made me feel...I was like 'yeah, it is true.' He is not even rich, but it is more like the psychology of his background, like he is very power driven.

Thus, the assertion that Bourdieuan capital is a more effective framing than Yosso's is not deficit in nature because, as participants pointed out, there are concrete advantages provided by those who are privileged by social class and race. It is not deficit to point out that in fact, Latinos lack material resources that are valued in particular contexts, including higher education. The problem is not our framing of lack of capital, but the field of higher education that requires capital that privileges affluent Whites. Participants named connection between socioeconomic status and privilege. They recognized that a higher social class background brought with it opportunities and access to more instruction in math and science that put some of his classmates at an educational advantage in engineering.

The purpose of highlighting participants' perceptions of socioeconomic privileges of peers is not to suggest that they were envious or that complaining about not coming from a higher socioeconomic background, but to demonstrate a high level of participants' awareness of the connection between socioeconomic status and educational advantage. Arguably, their ability to make this connection was, at least to some extent, a consequence of some of their educational experiences (described in Chapter 4) which first introduced to them educational disparities between themselves and others. In essence, pre-college educational experiences primed participants' understanding of the educational advantages they observed among peers in the college context. Interestingly, although participants also described recalling experiences in their pre-college education, they were less willing, and/or able, to assert that race, broadly conceived, was a factor in college. A conversation about participants' perceptions of diversity highlights

their position that for them, race as a social identity was less important than social class in the college context. Thus, participants' initial perceptions of the campus environment revealed that they saw it primarily in terms of class and socioeconomic difference between themselves and peers, and based on the connections they had observed before college about the connection between social class and educational opportunities, they felt challenged by having to adjust to this environment. After all, is it not the absence (capital/advantage among students of color) of something but the presence of something (capital/advantage among White students) that we should be centralizing in the context of a discussion of the historical representation of students of color?

**Perceptions of diversity and campus climate.** Participants talked at length about their perceptions of diversity on campus. These discussions centered on participants describing the campus environment as racially diverse, and then qualifying that assertion or providing evidence to the contrary. For example, one participant stated: "There are basically some from every ethnicity. There was White people, Black people. It was a mix. I see members of every ethnicity. I just see them as people." This participant went on to say that social class was more salient to him than race. Although, he did not refer to social class per say. He instead chose to describe observed differences between himself and peers in terms of "attitude." He said:

Yeah, to me that is more noticeable than race. . . . Maybe like attitude. I have been associated with people from all over the place. There were ones that had a bit more money and those that needed money. I associated with those people back then and I would see the class, as you say, wasn't as big of an issue as you make it. The way they act and talk. In my opinion you can look at someone and not even at the race they are and look at the way they sit, talk and you can know

more. That gives you more. . . it gives you a better image when you go back home and you can remember him. *You are not going to remember him as that one White kid or that one Mexican kid. You are going to remember as that one snobby kid or that kid I related to.* So you notice when someone is dressed a certain way and behaves a certain way. I would say I choose not to let it affect my life negatively. You haven't been made to feel that you don't belong because of your race/ethnicity? No because there is everybody here. I would think that if you get isolated here because of your race/ethnicity or whatever, there are a whole bunch of others like you that you can associated yourself with and not really let other peoples' comments affect you.

As we observed in the preceding section, participants consistently asserted the importance of social class or socioeconomic status in shaping their experiences, though a few struggled to find the language with which to describe their observations. This particular participant asserted a belief in colorblind ideology (Bonilla-Silva & Babbie, 2003), stating that he doesn't see people in terms of their racial identity. He truly believed that the basis of the connections he would make on campus would be based on an individual's personality, not their racial or ethnic background. He and other participants, particularly those who were children of immigrants and believed strongly in meritocratic ideals, consistently denied the salience of race and insisted that factors associated with socioeconomic status were most significant in shaping their experiences. The point in offering this example is to not suggest that race/ethnicity need be salient to participants. However, given this study's focus on participants' understanding of race and racism, it is important to understand what is salient to participants, why, and how it becomes salient to them. Analysis of the interview data suggests that participants' observations of

educational disparities before and while in college lead them to hold social class as a “master status.” Sociologist Robert Merton (1972) defined a master status as that which is evoked and made salient among other social identities within a particular context

Participants clearly demonstrated that their understanding of race was that it was subsidiary to social class and for some participants, particularly those in closer proximity to an immigrant experience, it was difficult to come to terms with circumstances that made them feel as though they were being defined by their race, that is, experiences in which they were racialized. Basically, participants gave ample evidence that social class was a salient social identity and that they believed it was more salient than race. They struggled to make sense of instances in which, despite their beliefs about a colorblind society, race played a role in their experiences on campus. For example, one participant stated:

This university is really diverse. *Diverse in terms of international rates.* It's just crazy walking up and down the involvement fair with different groups to join like Iranians for this or that, like really specific. It's really crazy to see how many different types of students are here. Like even though [this institution] claims to have 14% Latino, a good portion of them are like 3rd or 4th generation or like 1/16 of Latin descent or like if your great great grandfather was Bolivian, you could say you're Hispanic. A lot of students come from wealthy backgrounds and are 1/32 Bolivian and come here saying they are Hispanic. They feel like that is their way to. . . Wealthy Latinos from Latin American don't get financial aid because it's only for U.S. citizens. Either they have to get scholarship or have their parents pay for it or take out a loan. International students, you can just expect them to have money because they wouldn't take out loans. I click more

with the ones that come from a similar background than I do with the others. If there were to be a really rich guy coming here from Mexico and like some Asian guy from South Central, I'd click more with the guy from South Central because we faced more of the same challenges because our struggles to get here are more likely to be similar.

This participant's description of the culture shock he experienced included a reflection on the extent to which he believed campus was diverse. He started out describing ways in which it was diverse in terms of ethnic groups (e. g. Iranian, Bolivians, etc.) but points out that ethnic diversity is limited to wealthy international students. He notes the superficial representation of Latinos on campus (e. g. if your great great grandfather was Bolivian, you could say you're Hispanic) as well as limited socioeconomic diversity, saying that he is more likely to engage with peers of a different racial/ethnic background if they come from a more similar socioeconomic background. Further, although there may be other Latinos on campus, he asserts that they do not share his ethnic, socioeconomic background, or immigrant experiences and their presence does provide him with a sense of representation on campus. It is important to here underscore that students posited that they found connection with others who shared their socioeconomic background and/or immigrant experiences more often than they did with those of the same racial background. Socioeconomic status and immigrant generation, as this quote reifies, were the most salient social identities in their experiences on campus. Another student described challenges associated with limited structural diversity in a similar way:

The transition wasn't a smooth one for me and I think that's for a lot of people so I came to a school that was a lot bigger and although I saw the same like statistics, I saw obviously more White people and more Asian That was then exemplified in

the classroom, inside an engineering class even more. You're not going to see many Latinos there. Also what I think was hard for me in my sophomore year was seeing people who were Latino like me not succeeding in the same manner. There are some people who I really learned from who are Latinos. They succeed extremely well in academics and they surpass a lot of us. And just based on the few that I'm thinking of, contradictory to what I previously said, they're really focused on an American culture. All 3 of these kids that I have in mind – they don't speak any Spanish. They're all just full English and all about their . . .

They're just really focused on their gun. I think that there's just. . . it's twofold.

This statement is representative of what was common across the board: participants called their campus diverse but then qualified such statements by noting limited racial/ethnic and socioeconomic diversity, resulting in the shock previously described at the start of this chapter. Further, participants talked about characteristics of the environment that were unsettling, at best, and hostile, at worst. Based their claims about the race-neutrality of their campuses and the primacy of social class in shaping educational opportunity, I asked participants to reflect on the extent to which race, broadly, played a role in shaping their experiences, if at all. Participants denied such a role, but said racial stereotypes may be part of the campus environment. One young man stated:

I've read stuff in the past. I wouldn't say that this is a racist place but some people do make stereotypes. Not necessarily in my case but just in general. People do say. . . like I don't want to say taboo things but people do say that Latinos aren't as smart as people from other races. There are people that have that messed up thinking. It is not true. Everybody at one point is on an equal playing ground. It

is ultimately what you do and how much work you put in that ultimately defines how successful you truly are. . . . [Opportunity to be an engineer] is not based on race. It is just based on genetic background, family history, along those lines. So being an engineer requires intellect, self-motivation, and natural ability. Yeah. What I just believe is just because you are a Latino in engineering doesn't mean you are at a great disadvantage. It also doesn't mean you are at an advantage.

You are in the middle ground. Almost everyone else is in the middle ground.

This participant identified negative racial stereotypes as “taboo things” that shape how people think about Latinos and their intellectual abilities. He noted that the existence of such ideas did not represent any real challenges to him or other Latinos. Further, he asserts that everyone is in the middle ground and has the ability to achieve in spite of stereotypes. Other participants took a similar stance on the significance of race and racism in the college context. Another participant stated about race:

I don't think it has played a role. Especially since some people mistake me for Persian [laughter]. Most people don't perceive me as Mexican at all. They think I'm. . . apparently I have very Persian qualities. I'm like ‘Okay, if you say so.’ In terms of being Latinos, I know there is not as many Latino engineers, once I looked into it. I learned that there was a small percentage. I guess here. . . coming to here is the most, I guess seeing less brown faces and seeing more White and Asian faces because that is the majority. It's just a fact. So seeing a little bit of Latinos in engineering and a small number of Latinos anywhere [on campus] I guess.



For this participant, and several others, participants believed that race didn't play a role in their experience, but identified specific instances in which they were racialized. For this participant, his experience in being radicalized as Persian wasn't interpreted as inherently negative. It was something he was able to laugh off and not take seriously. He posited that people perceiving him as Latino or not was not as relevant in his experiences as the limited number of Latinos on campus with whom he could connect. Again, a lack of peers with whom students of color can connect is identified as a negative consequence of limited structural diversity in extant literature. However, this study highlights just how much of a disconnection there was between participants' expectations for diversity and a race-neutral environment and their experiences with limited socioeconomic and racial diversity. Nearly every description of the campus environment included a limited number of Latinos:

I don't see that many Latinos in classes, so that is one of the main things because Asians dominate, that is just a fact. Then it is White Anglo Americans. Then it is Latinos. That is in the school, not in engineering. Like when it comes down to engineering, those numbers go down. I guess seeing more of a mixture instead of just White or Asian. So you feel there should be more even numbers of groups? Yeah that would be better overall. Because most of my friends in engineering that are not in [my MRP] would have to be Asian, because they are the majority. That is about it. Because I know looking at the stats, Latinos are supposed to be the third largest, but once you get to south campus, they are really tiny.

Participants, at first, described their campus as colorblind or a space in which race is not a relevant and then described specific ways in which they were racialized. Racialization occurred when peers prescribed participants a racialized identity, when they became aware of limited

structural diversity, or when they realized that negative racial stereotypes were directed at them.

Other forms of racialization were more direct, in the form of racial microaggressions.

Participants, even among those who had said that race had not played a role in their experiences, described encounters with racial microaggressions. Frequently, participants said they experienced statements like: “You're a coconut. You're cool. You're Mexican but you're White like me” or “you are the smartest Latino I know.” One participant said that his institution was welcoming, but acknowledged that this was likely because he phenotypically didn't “look Mexican.” He said that he had no direct experiences with being racialized or racism, then described experiencing racial microaggressions. He said:

I cannot say that. The doors are open everywhere. The students feel pretty welcoming. I have been told that I don't look Mexican. So that might be it. I don't know. But I can tell you I never felt anything bad. . . . I feel like Latinos are very good, very high competency. We are very capable. People think that I am not. I mean. . . I don't feel it in engineering classes, but I feel it in my dorms or something. Yes. It sounds harsh. A lot of people get surprised when I say that I am Latino and studying engineering. They say, ‘Wow, you're Latino, must be smart.’ They sound a little surprised.

Microaggressions had the effect of leading participants to believe, despite their academic achievement and high level of self-confidence, that they were not deserving of admission to a highly selective institution. This, effectively, was affirmative action stigma. One participant said, “Yeah I guess it is good that they are not acting on affirmative action but I believe they are still using it because otherwise I don't think I would have gotten in here.” I followed up with this

statement by asking whether or not this participant believed his institution practiced affirmative action and whether or not he was against that practice. He replied:

Definitely. I have a lot of qualms. I feel that it shouldn't be used but then again, I wouldn't be here had it not been from that. Honestly, I do [believe that]. I really do. My SAT scores weren't that great. My GPA was great but my SAT scores were not really engineering worthy compared to all these other students that got 2300s and I got like a 1950. That was the highest in my high school at the time and I was like okay well I mean I guess that could have been factored in too. . . .  
but. . . .

Indeed, the biggest themes regarding participants' perceptions and experiences in the broader campus context were that participants consistently identified ways in which peers from higher socioeconomic backgrounds benefited from academic, social, and cultural capital. Because of such benefits held by peers, they feared the academic consequences they would face in engineering. They asserted the primacy of social class, identifying it as the most salient social identity, or "master status." Yet, participants experienced racializing experiences that were caused them to reconsider themselves as members of a racialized ethnic group. Ultimately, participants experienced culture shock because of a lack of peers from similar socioeconomic, ethnic, and racial backgrounds, asserted the primacy of social class in shaping their experiences, and struggled to make meaning of racializing experiences. Such findings suggest that there should be more attention paid to how limited opportunities for students to engage with their social identities leads to confusion about the nature of intersecting oppressions.

## **II. Race and Racism in Engineering**

This section of the chapter will describe how participants were racialized within the context of engineering. Racialization in the context of engineering was similar to that observed in the broader college context in that participants were racialized (made aware of their status as a member of a racialized minority ethnic group) primarily via limited structural diversity, which contributed to their experiences with stereotypes and microaggressions. In engineering, they faced an even more obvious lack of structural diversity. Within this context, racialization occurred primarily via stigmatization as a result of their participation in minority retention programs. Collectively, participants' experiences in being racialized across both contexts had implications for their understanding of race and racism, which would shape their persistence strategies.

**Perceptions of Diversity in Engineering.** As participants described their experiences in engineering, they consistently identified a lack of racial diversity in their classes, their specific engineering major, and in engineering in general. Participants seemed to demonstrate a greater comfortability in discussing diversity (or lack thereof) in engineering than they had with the broader campus environment, perhaps because they perceived a greater level of diversity in the broader campus environment than in their field or perhaps because their engagement on campus lay primarily within their field of study. In other words, it seemed okay to admit there were few Latinos in engineering whereas there was much more reservation to paint a potentially negative portrait of the broader campus. Participants often started out by saying that engineering was diverse but then went on to qualify those statements with evidence to the contrary. Yet in engineering, the limited number of Latinos seemed more pronounced. For example, one participant stated:

The thing that bothers me is the lack of minorities within engineering. It is kinda hypocritical of me to say that because I don't identify as purely Latino and stuff like that but knowing that minorities are the lesser of engineering where it is dominantly Asian and Caucasian people in engineering. It still bothers me that it is that way. You can see there is still separation, I guess. Like in all my classes this quarter there are three or four Latinos out of the 120 students there. It is like predominately Asian and Caucasian and just three or four of us that are in those classes. And it's good for me I think because it is going to force me to assimilate with other people in those classes in that respect. But it is also concerning to me because it is like, *WHERE ARE THEY?* We need more people that are representative of the Latino cultures, African American cultures.

This participant expressed concern over a lack of Latinos in engineering, and this concern was representative of what most participants shared. Participants' understanding of limited structural diversity was developed through their frequent experiences of being the only Latino in their classes or within their engineering subfield. This lack of other Latino students resulted in reflection among participants about why this might be the case. Indeed, a major focus of interview discussions was the underrepresentation of Latinos in engineering, which revealed important insights about the extent to which participants understood such limited diversity as a systemic and institutional consequence of a legacy of racial discrimination in higher education.

It is important here to clarify the relationship between racial identity development and students' understanding of race and racism. Typically, studies that have explored students' of color subjective experiences with race and racism have focused on understanding the processes involved in individual racial identity development (Helms, 1990; Ponterotto & Casas, 1991).

Racial identity is perceived as a consequence of interaction between individuals and the college environment and much attention is paid to the extent to which individuals experience dissonance, or a disconnect between their ideas about themselves and how they are perceived, when coming to college. There has been much less, if any, attention paid to students' *reflections or ideas of such processes as they are occurring, or of the understanding of race and racism that may inform such developmental processes*, resulting in insufficient exploration of the interplay between racial identity development and students' understanding of race and racism. While racial identity formation was not the focus of this study (and thus may contribute to this insufficiency), findings suggest that framing of students' understanding of race and racism primarily as a consequence of one's racial identity formation (i.e. individuals at various stages of racial identity development believe this about race and racism) may be more limiting than treating understanding of race and racism as a as distinct student distinct student characteristics that inform why dissonance, and subsequent identity development, might take place. In other words, participants' understanding of race and racism may not only reflect where they were in terms of stages of racial identity development, but also help us to understand the ideological contexts of that development.

#### **Explanations and Consequences of Underrepresentation of Latinos in Engineering.**

Though definitely not true of all participants, some participants expressed culturally deficit views of Latinos in explaining their underrepresentation in STEM fields. These views might be understood as a negative consequence of underrepresentation in that participants struggled to understand why there were so few Latinos in engineering. Their statements seemed to reflect negative beliefs and stereotypes about Latinos in society that have been internalized by those trying to make sense of why they were the only brown or Black person in their engineering

courses or their engineering subfield. Some participants shared that from their perspective, the problem of underrepresentation was, at least to some extent a result of characteristics of Latino families and culture. One participant said:

I hope that...of course I would like more Latinos here in engineering but I know that is up to the students in high school to get good grades. And that is up to the family...I have seen it myself. The parents they push more the work ethics or right after school go to work to help and everything than to study. That's how they were raised to and that's just following it. I think it is true for everyone whose parents did not go to school. They should emphasize education more so they shouldn't have to work so hard.

This participant's statement seemed to be informed by immigrant generation in that those in closer proximity to an immigrant experience emphasized meritocratic ideas about why they managed to be academically successful while others in their community had not managed to do the same. Although all participants talked about why they believed Latinos were underrepresented in STEM fields and in engineering, very few held this negative perspective.

Others emphasized the socioeconomic conditions prevented many Latino parents from sending their children to college, much less for an engineering degree. One participant recognized that parents from working class backgrounds may emphasize work over education for their children, without meaning to delimit their opportunities for upward social mobility. He also pointed out that Latinos, regardless of immigrant generation, may not have college-educated parents. This was rare because most 2<sup>nd</sup> generation participants seemed to describe their later generation Latino counterparts as being privileged by the fact that their parents went to college. For example:

I encountered students whose parents were engineers. Who were not first generation American but third or fourth. So you can say well my father is an engineer or my father is a doctor and that kind of stuff. There is people who have already gone through the system, even though it might have been 20 or 30 years ago, they know. So they are able to do more for the children to make them successful because they have some higher education. At that point higher education is no longer an option for them, they have to go. All your life you know you are going to college. And because of your parents' background, you have connections. They can say 'oh my father got me a job at such and such place' and for me I feel like anybody has contacts, I just stayed home and just spent time with my family. And you are not getting that experience during your summers.

Thus, a trend in the data was that 2<sup>nd</sup> generation students believed that those with native-born parents were at a greater advantage than they were and they associated later generation status with college going, which sociological literature on educational outcomes and immigrant generation tells us is not often the case for Mexican Americans (Telles & Ortiz, 2008). This was a particularly important trend in the data because it shed light on how participants viewed co-ethnic Latino students and how they understand their own educational opportunities as it pertained to race, ethnicity, social class, and immigrant generation.

Some students seemed to recognize the privileges of international students in engineering, Latino or not, pointing to the higher levels of wealth they must have to attend highly selective four-year institutions out of pocket. One participant explained:



Wealthy Latinos from Latin American don't get financial aid because it's only for U.S. citizens. Either they have to get scholarship or have their parents pay for it or take out a loan. International students, you can just expect them to have money because they wouldn't take out loans.

Perceived differences in advantages/disadvantages by immigrant generation was important theme that emerged from discussions with participants. International students (or non-Latino) and White Americans were perceived as having the greatest level of advantage. One graduate student described his perceptions of extreme wealth and privilege on campus, particularly in engineering. He said:

As far as struggles, I would say the disadvantage that my parents have is the most significant disadvantage that I had. My parents never said go get a Master's or you should go get a PhD. Where I know a lot of Chinese parents, Indian parents, Iranian parents they tell their children to go for a PhD. . . I figured it out along the way. I kinda learned from my experiences that there is more than just getting an education. It is getting the right experience, getting the right degree. So for example, the disadvantages that have come about here have been that the American students have been third and fourth generation students- 'My parents came to [this school] and my grandparents came to [this institution]. It is a family thing. ' Where my parents don't even know what [this institution] is. *See, there is a network that is passed down in the United States. Privilege to privilege to privilege. That is the epitome of [this institution].* They take care of their own. That is what I see here.

He notes, as we observed other participants note in the discussion of the broader campus environment, that he felt that there was great socioeconomic privilege around him, and this was the biggest struggle he faced. This particular participant said he was the only Latino in his graduate program. This participant went on to highlight how international students manage to further access privilege and assert that Latinos remain without a “system” for accessing these same advantages. He stated:

When it comes to international students. You see a lot of international students in my program. There are no Hispanics. Hispanics, forget about it! I rarely see them. The Americans are here because of the tradition. White Americans. Caucasians. The international students, I have heard some of them say that they cheat their way in here. They cheat on tests. I’ll give you an example. One of the requirements to get into the program here is to get a high score on the GRE, I am not sure if you took it or not. Anyway, they get a guy to fly to a different time zone so they take it at the same time. They fly to a different time zone and send screen shots of it so the people back home know what is going to be on the test ahead of time. [Another student] told me that he purposely missed answers so that he wouldn't get caught. So if he does it, think about how many other international students do it? It boggles my mind. They barely speak English. I speak English and I can barely do this stuff. *How do they get here?* It makes you think. I am not going to say that all of them do that. *I am even at a disadvantage with them because they got a system going on.* But they have a system back home. It doesn't matter if you are first generation, second generation like the *White Americans are part of a system* and they are also part of the [university

legacy] tradition system that is handed down generation to generation. *They are actually a part of a cheating system.* I don't want to say it that way, but they are part of a system that gets them through these programs. *If you are not a part of a system you are not going to be able to do it.* The system I was a part of was the 'just go get your ass kicked and see how you come out.'

Overall, findings indicated that with regard to explanations for Latino underrepresentation in engineering, later generation students were more likely to attributed disparities in educational opportunity and underrepresentation in higher education to limited resources and systemic inequities faced by Latinos and other populations in the United States. For example, one student described:

I attribute it to circumstances. Like they didn't have the resources. Yeah but I always had role models. Not from my family...that is sad. But knowing that other people, they had relatives in jail, unemployed, drug addiction. *That is who they are surrounded by. So it is hard to see yourself pursuing anything else.*

This participant seems to demonstrate an understanding of the social and environmental factors that contributed to Latinos in his community being tracked out of higher education. Such an interpretation is consistent with Pierre Bourdieu's conceptualization of habitus, "a system of class-specific dispositions that shape an individual's actions so as to reproduce and perpetuate existing systems of hierarchy." Habitus plays a major role in perpetuating inequality (Ovink & Veazey, 2011) because it socializes individuals to unconsciously internalize external opportunity structures and develop aspirations and expectations and orient action toward conduct we deem appropriate for 'people like us.' (Mahar, Harker, & Wilkes, 1990). In addition to these perspectives about the Latino community, participants also described that not only were Latinos

underrepresented in engineering, but of those who managed to make it into engineering often struggled. They bore witness to numerous peers dropping out of engineering, which made them further struggle to make meaning of these conditions. Just as most participants identified culture shock as their primary challenge in arriving on campus, so too did they identify this as a challenge in entering engineering. As one participant stated:

The transition wasn't a smooth one for me and I think that's for a lot of people so I came to a school that was a lot bigger and although I saw the same like statistics, I saw obviously more White people and more Asian. That was then exemplified in the classroom, inside an engineering class even more. You're not going to see many Latinos there. Also what I think was hard for me in my sophomore year was seeing people who were Latino like me not succeeding in the same manner.

Beyond struggling to make meaning out of their experiences as underrepresented racialized minorities in engineering, participants described the negative psychological consequences associated with being underrepresented. For example:

I ... it's a psychological aspect when you don't notice ... when you go into ... let's say I'm interested in women's studies and I pursue women's studies and I go into a meeting with all of these really famous women's studies professors and they all happen to be women. I'm like well maybe I'm not supposed to be there. Maybe I'm not supposed to be doing this. Maybe I'm not going to succeed if I do that. And it's not something you consciously think. I don't consciously think I'm not supposed to be succeeding in engineering. On the contrary, I try as hard as I possibly can. I spend sleepless nights. Right now, I'm not sleeping because it

and I'm to explain myself as a qualified engineer like qualified candidate for these research opportunities and I'm still trying to graduate with a respectable GPA.

This participant described being challenged by being the only Latino in his engineering classes, but emphasized that this would not deter him or, ultimately, make him feel that he did not belong in engineering. Indeed, it was a common image described by participants to be the only Latino in class and rather than just documenting these experiences, this study was focusing on understanding specifically the strategies participants used to overcome moments of doubt or the feeling of being alone. Such strategies will be described more fully in the next chapter.

**Not Americans.** It was interesting to observe that in talking about White Americans, participants referred to them as Americans. On many occasions, particularly in the context of discussing structural diversity on campus and in engineering participants refrained from using racial language of White, referring to those with racial or class privileges as Americans. Participants did not refer to Latinos as Americans, unless a participant was describing their ethnic identity (e. g. extent to which they fit the American versus Mexican labels, etc. described in Chapter 5). Further, participants were racialized in engineering via interactions in which peers who wondered which country they were from, never assuming that they could be American or native born.

I don't think it has played a role. Especially since some people mistake me for Persian [laughter]. Most people don't perceive me as Mexican at all. They think I'm...apparently I have very Persian qualities. I'm like 'Okay, if you say so.' In terms of being Latinos, I know there is not as many Latino engineers, once I looked into it. I learned that there was a small percentage. I guess here... is the most, I guess seeing less brown faces and seeing more White and Asian faces

because that is the majority. It's just a fact. So seeing a little bit of Latinos in engineering and a small number of Latinos anywhere [on campus] I guess.

Here, this participant shrugged this experience off as insignificant, as did others. Though not directly hurtful or inconsequential in terms of presenting a challenge to participants, these incidents seem to “teach” participants what “they were.” Such instances provided this group of young men with an understanding of how others perceived them (as a member of a race) despite their desire to be race-less. In other words, participants were racialized as non-White and non-American. While large populations of Latinos are immigrants, there are also a number who are not. There is an extensive history of Latinos, particularly Mexican-Americans, living in the United States. Yet, consistently, Mexican-Americans and other Latinos are racialized as immigrants and treated with not only racial hostility and discrimination, but also xenophobia.

**Colorblindness.** As we saw earlier in this and previous chapters, participants emphatically asserted that social class played a role in shaping educational opportunity. When asked directly about how they identified (ethnically or racially), some struggled to find language with which to label themselves. They insisted again and again that race was not a factor in their experiences, perhaps only sometimes because it shaped their cultural beliefs and practices, and suggested that people see each other as individuals, not as a member of a racialized group.

**Racial microaggressions.** Participants expressed negative racial stereotypes about Latinos on campus. Even within the most positive descriptions of campus climate was an assertion that Latinos still experience negative racial stereotypes. Other students said that lack of Spanish-speaking students made him realize that he was underrepresented on campus and in his engineering classes. In describing the challenges he faced in coming to campus, he said: their

campus environment, it became clear that they perceived negative racial stereotypes about Latinos on campus.

**Stigmatization in a Minority Retention Program (MRP).** All study participants at one of the two institutions in this study were recruited to participate in a program designed increase the retention of historically underrepresented minority (URM) students in engineering. The MRP program provided participants with additional support services such as tutoring, networking nights, workshops, clustered curriculum. It was identified as a primary source of support for every single participant who participated. Again and again, participants said the MRP was “the best that that ever happened to me. Minorities are not being recognized as a good force within engineering and that is why MRP exists- to get those people in.” Other participants described how MRP was the primary way by which they established and sustained friendship groups. Several participants shared:

My and my friends joke around that this degree we get is a collaborative effort because we all worked hard and we all studied together most of our four years. I see my diploma and their diploma and other friends’ diploma as part of it as mine and part of mine is theirs because they helped me out so much.

Consistently participant stated only that MRP was the most helpful resource on campus in terms of providing social connection to other Latinos. One student said:

So that is where MRP comes into play. In my first year, I was played into MRP for which I am eternally grateful. They do so much. Their main goal is to help minorities in engineering. The thing is though, when I came here my first year, I met a lot of students that had my same or similar background to mine.

Another participant stated: “MRP forces you to make friends among other minorities in engineering.” While providing important support to students, minority retention programs recruited them as Latino students- made them aware of their status as underrepresented minority students. This occurred by the practice of grouping students together based on race and also by comments from peers.

**Grouping by race.** Being placed in MRP was helpful to students but some expressed guilt for receiving resources that they felt could be used by more disadvantaged students. Some participants felt bad that others were not getting the same resources, which influenced their questioning of affirmative action policies more broadly. For example, one participant acknowledged the underrepresentation of Latinos in engineering but didn’t know that the MRP was targeting the appropriate groups of students. He stated:

I don’t know how it would be fixed. I definitely see there are people in MRP who would benefit from those but there are people are not in MRP and would never have the chance to be in MRP who could also really benefit from those but aren’t getting them. Kids I know on my floor or my floor my freshman and sophomore year who are Asian who aren’t going to get any sort of minority help from things even though they are struggling or not well off socially because they could also benefit.

Another participant said:

I guess the point is that it feels weird because you have all these benefits and I have all these friends who came from the same socioeconomic background as me and I don’t feel like I need these as much as some of my peers who I could see need a study space because they commute from East LA, or things like that. Or



has anyone told you about how they have tutoring for classes on the hill? Yeah, this is separate and they have tutoring sessions offered by the school. This is totally separate from that that MRP would do; where they would have their students come to tutoring by their junior and senior members. So things like that, where I feel those are super helpful and those are really good benefits, it would be really good to offer those to people because they really do help people but then when you have the friends who know your story and see that you have these benefits, they might be like ‘why do you have all these benefits when we are on the same level.’

Another participant, also from a higher socioeconomic background described that because he was Latino, he was selected to participate in this program despite the fact that he didn't really need the resources offered. He, however, did not feel guilty or stigmatized, but that his benefits were a consequence of trying to target Latinos as a whole. He stated:

I would say I would be...for me being Hispanic hasn't had a big effect, it is just a plus I would say. I could see it...some people I have talked to that has been a predominant.... like they came from a difficult, low income school... for example one of my roommates, he never took physics because his high school never had physics. So now he is taking it for the first time and he is competing with people who were in AP physics. He is struggling. So I guess that is why I understand why there is affirmative...or MRP because this demographic usually experiences these kinds of issues, and we have to help them. Then there are people like me, who didn't really have that issue and because I am Hispanic like I managed to get into that little group still. I think what they are doing is great, you can't really do

it based on...every case is different so you might as well go for the larger bulk.

You are going to get exceptions. So I probably wouldn't have needed being in MRP as much as other people who need it , I was able to.

**Comments from peers.** Despite the clear and many benefits associated with participation in MRP, participants also experienced negative consequences associated with participation: stigmatization. This occurred when participants encountered racial stigmatization when they went to use the MRP library and others had a problem with it. One participant said:

I've always had a weird feeling toward segmented...because sometimes it does feel really exclusive because like for MRP they have this thing called the learning center. It is like a study space with free printing and computers and white boards. It is a really good resource but when I switched from being in classes that had a lot of MRP people, to classes with people who weren't in MRP, there were a lot of times that my friends would be like OH WE ARE GOING TO STUDY IN THE MRP CENTER. And I would have friends who are Indian or Pilipino and we would be like OH WE ARE GOING TO STUDY IN THE LIBRARY BECAUSE WE CAN'T GO STUDY IN THERE.... It feels weird to be like 'oh there is this place where I can go get free printing and stuff but you guys can't go in there. '

Another participant recalled similar experiences, but emphasized that this didn't necessarily make him feel guilty or upset. He recognized, however, that his peers perceived him as receiving an unfair advantage. He said, "I can think of the one or two times where I've told people about the MRP center and they've been like 'oh yeah, we can't go there. Why do you guys get that? That's not fair. '"

**Other forms of URM retention programs.** Other participants at PCU did not get to be put into a program automatically. Their minority retention program was optional and no participants in the sample participated in it. Some of the PCU kids did participate in an all Latino floor. They didn't feel stigmatized by this because this didn't result in perceived benefits by their peers. However they did identify the drawbacks of connecting with Latinos on their floor as being limited opportunities for cross-racial interaction.

### **Chapter Conclusion**

Participants' understanding of race and racism, as identified by the guiding research questions for this study, were revealed through processes of racialization and racial identification across three contexts: their pre-college environment, their college environment, and the engineering environment. A central finding is that although participants identified and described instances in which they were racialized within each context, most denied the significance of race and racism in shaping their overall experiences.

## Chapter 7: Responding To Racialization, Race, And Racism:

### Cognitive Racial Reappraisal Persistence Strategies

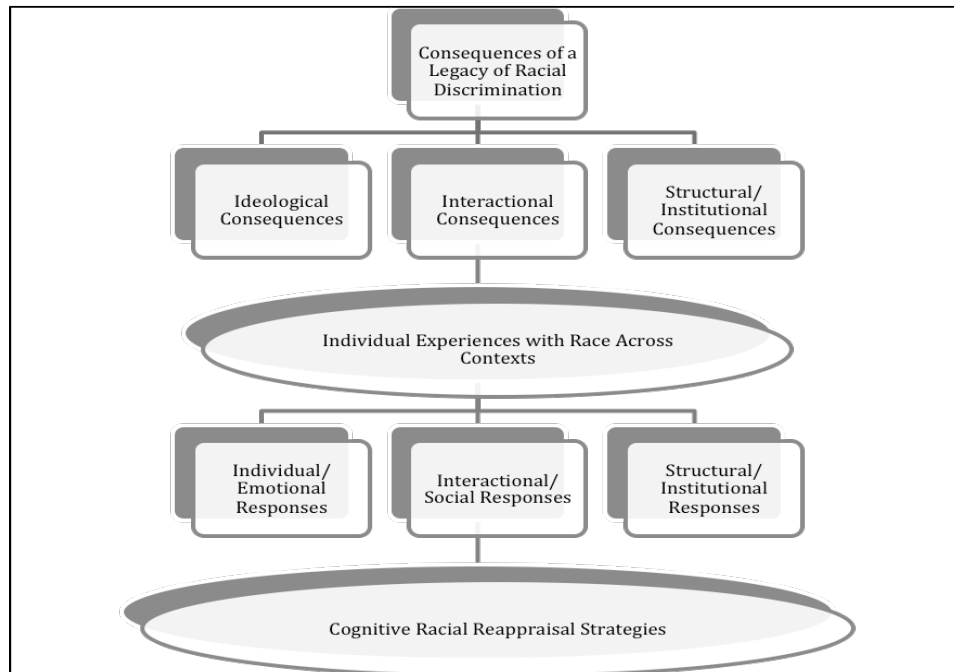
If we consider that, *a priori*, race and racism are endemic to American society and all U. S. institutions (including college and universities), then we can imagine ideological, interactional, and structural consequences as vestiges of this legacy of racial discrimination. *Ideological consequences* include a denial of the significance of race and racism in shaping educational opportunities and outcomes while emphasizing meritocratic ideals that have proven to be baseless in light of a stratified American opportunity structure. *Interactional consequences* can be understood as racial assaults in the form of racial microaggressions directed at one individual or group by another. *Structural consequences* of a legacy of racial discrimination are manifested in limited racial and socioeconomic diversity on college campuses.

If we accept that colleges and universities are rooted in a historical legacy of racial discrimination, then we must accept that 1) there are ideological, interactional, and structural consequences of that legacy and 2) that students of color must confront these consequences and try to be successful in spite of them. Drawing on both a Critical Race Theory and Physiosocial Ecological Framework for Understanding the Ontological nature of race and racism, this study proposes that in light of ideological, interactional, and structural consequences associated with race and racism, individuals are embedded within multiple social contexts in which they are racialized. As individuals move through those contexts, they develop strategies for responding to race and racism in order to support their persistence in engineering. Such responses might be categorized as individual, interactional, and structural strategies that collectively, represent an individual's attempt to reappraise their racialized status and persist in an inherently stratified, racialized system of educational opportunity. Figure 3 offers a visual model for understanding

the relationship between race and racism as endemic to higher education institutions and the individual *cognitive racial reappraisal persistence strategies* of Latino male engineering students. Cognitive racial reappraisal persistence strategies refer to:

The bridging and buffering strategies that allow racialized, minoritized students of color to protect (buffer) themselves from the negative aspects of a racially hostile college environment while simultaneously accessing (bridging) that same environment for the resources on which they inevitably depend. Such strategies may limit interaction and expand interaction with the environment as needed in order to attain needed resources. These strategies are deemed necessary by virtue of the nature of the college environment in which students of color experience racial hostility yet are dependent upon for resources. Collectively, bridging and buffering strategies represent an attempt of individual to protect a core academic identity *as well as to redefine for others and/or themselves a socially constructed racial identity*.

This chapter will describe institutional, interactional, and individuals level strategies employed by study participants as they responded to race and racism across the broader college environment and engineering.



**Figure 3** Cognitive Racial Reappraisal Persistence Strategies of Latino Male Engineering Students

### Section I: Individual Level Persistence Strategies

Upon entering an engineering context, most participants were immediately aware of the underrepresentation or their racial and/or ethnic group. Some participants described feeling sadness upon noticing limited number of Latino classmates but talked about how they managed to transform negative feelings into more positive ones by focusing on communities from which they came. One participant, processed:

For me personally, there is a fire. I am invigorated, energized. You want to make sure that you do well. But also there is a sadness to think that...just knowing the friends from back home will never have this opportunity. You know from first hand experiences that it is not necessarily their fault. You wish things would have gone differently.

When asked why, upon feeling distressed by his underrepresentation, how he was able to continue to persist, another participant said:

When you are in a room full of Latinos, you feel that there is a pretty good amount of us but when you are in classes, you realize it is actually a very very small group. What keeps me from walking out of that room is knowing that I paid to be in that room. A second thing is just knowing that even though there are not a lot of us in that room, other Hispanic friends that may be in that class, I know that they are there. I might not be able to see them but I know they are there.

Here, this and the previous participant describe drawing strength from other Latino students to know that though they are few in number, they can rely on other Latino students for support and that there are other members of the Latino community who can't be in the classroom with them. Consistently, participants described an acute awareness not only of their underrepresentation but of other Latinos from their home communities who were not, for whatever reason, afforded the privilege of going to college. In light of their underrepresentation, a common theme that emerged was that participants remembered and were inspired by their home communities. This cognitive processing of making a potentially negative situation better and buffering against the consequences of underrepresentation might be referred to as a cognitive racial reappraisal strategy because it allowed students to stay motivated despite motivating circumstances. Students also stayed motivated by reminding themselves of their academic abilities. One student said the primary source of his success was drawing on his knowledge of his abilities. He stated:

Number one I think is the confidence knowing that you are really not that, academically, not that disadvantaged. It is not like they are downloading

information into their brain that you don't have access to. They are studying so you are going to study. For me, in order to gain that confidence knowing that I will do well in my classes I make sure I do attend office hours. If I have a question I make sure I ask. So in the end I should get the result I want. Just getting that assurance.

This participant emphasized to himself that despite advantages of peers, there was no inherent reason why his intellectual abilities could not propel him to be successful in engineering. He reconsidered a stressful situation and the negative emotions associated with it and decided to reassess the situation in light of his strong academic background and capabilities.

**Proving them wrong.** When participants talked about stereotypes about Latinos, they adopted an attitude proving them wrong. Previous research on racial minority students has identified this as a common response to stereotypes and racial microaggressions and defined it as an individual's desire to disprove negative beliefs about their academic ability. In describing negative stereotypes about Latinos' academic ability, one participant said:

Well there is the proving them that you can be successful as a Latino. When I have met with the reps they are all usually White or Asian. So you are thinking that if I make it I will be the Latino. You just hope that...because I know if I see someone who is Latino and they made it you see that there is an end. If they did it you can do it too.

Participants consistently described an acknowledgement of stereotypes and feelings of anger or frustration about the prevalence of those stereotypes. They then described a belief that if they put in the effort and work hard, they can serve as an example that those stereotypes are not true. One participant said:



Some people might think ‘oh Latinos are not as smart as other people’ or ‘he is at a disadvantage and we can be better than him.’ I don’t know maybe that is a stereotype that people have. I have never really heard it directly at me but some people have. Some maybe that is where the disadvantage part comes in. I think it is bogus and not true. In terms of advantage, you have a lot more benefits, resources, sure that may be true with some college programs, but in the end what it boils down to is that anyone can get an A, B, or a C it depends on how much studying you do. You can be one race and study more than the other. You can get a higher grade than someone from another race. But that doesn’t mean you are smarter than the higher race. It just means you got a higher grade because you were able to put more effort in.

Thus, participants considered that there may be negative perceptions of their academic abilities based on stereotypes about Latinos. Through a process of cognitive reappraisal, they shifted their thinking from negative feelings to more positive feelings that reinforced a positive self-concept and meritocratic ideals. Others still, focused on the benefits associated with being Latino in engineering or the current state of underrepresentation for Latinos in STEM. This focus on the desirability of being part of an underrepresented group centered on the belief that being Latino can make someone more marketable to a company looking to diversify their workforce. Many participants described hearing that companies are looking to hire those who are bilingual and/or Latino. For example, one participant said: ... “I am starting to see good things about being Latino and being in engineering. I joined the Latino society [SOLES] and they also told us that companies want diversity. They are looking for Latinos so that’s been growing on me...” The strategies of drawing strength from the Latino population who couldn’t

attend college, trying to disprove prove stereotypes about Latinos, or emphasizing the benefits of being an underrepresented racial minority in the context of initiatives to promote a more diverse STEM workforce represent bridging and buffering strategies.

From an open systems perspective, organizations must create boundaries between themselves and the environment, but these boundaries “must necessarily be sieves, not shapes, admitting the desirable flows and excluding the inappropriate or deleterious elements” (Scott, 1987 p. 170). Participants’ individual attitudes in response to their underrepresentation in their engineering classroom resemble the behavior of organizations. They let enough information in regarding limited Latinos in engineering so as to understand themselves as having this unique advantage, but did not dwell on the burdens associated with their underrepresentation. As Scott (1987) points out, “determining what is desirable or harmful can be a difficult decision in part because the criteria can vary from time to time and location to location.” Participants’ engagement in this same kind of decision making represented their attempt to reappraise their own racial value for themselves (reminding themselves that they were both smart and Latino) and for others (proving them wrong). Engagement in such a process reflects greater cognition than is unrecognized in extant literature that merely documents the “proving them wrong” attitude among students of color, without explicit consideration of how this is strategic and not reactionary.

For some participants, it seemed that despite their best efforts at buffering the negative aspects of the environment, including pressure to compete for a GPA above a 3.5, seemed not enough. They described being under a tremendous amount of pressure, which was taking a toll on their mental health. One participant described falling into a depression and feeling worthless because his GPA didn't rise high enough for his desired subfield of engineering. One way he

sought to bridge his isolation with the resources in his environment was to try counseling services on campus. He described:

You can make excuses if you want but if there is something in your control- I know you don't control your race or ethnicity. But you can control by looking for help or looking for someone to help you. There is not ever an excuse good enough. It may sound ghetto but my motto is 'stop bitching and do something about it.' that is how I live my first few years, I felt I am not good enough. But after two years of failing, I got tired of it and I decided to stop bitching and decided to hit the books. Even if it losing a couple pounds...it is hard for me to admit this but I was in a deep depression and felt that I wasn't good enough. I put on a lot of weight and I can say that in the end my outlook on it, I feel I got tired of looking at myself and seeing myself over 30lbs overweight so I decided to do something about it. So I year ago I lost like 50 pounds and I have kept it off most of this year because of that. If it is something that you don't like and you can change it, then why not change it. if you have the power to change it, then change it. it will take work, but that shouldn't stop you. I guess- what I hate most about engineering or people who struggle within engineering is why cover up the reality? So I went from a 2. 8 to 2. 9 GPA. I am an average engineer... *When you are told that if you don't have a 3. 0 that you can't do shit, you are taking the power away from you. . .* They took away my self-worth when I needed a 3. 5 to go into [my subfield] and they were like.... 'oh well you need a 3. 5' and I was struggling. I barely had a 2. 0. Then I failed a class. And of course I didn't have the 3. 5. *They took my self-worth away from me.* I tried going to counseling. I

guess a lot of people don't take advantage of that because they feel like it is a sense of weakness. I don't want to bag on psychology because it does have its benefits but the impression that I got was that they kept asking me 'how do you feel' and eventually I just got tired of hearing myself complain about my life and I just decided I am going to do something about it. I am just here and you are not helping me.

Here this participant described his individual strategy of self-motivation. He points out that no matter how hard he tried to stay motivated, he needed to branch out and seek support services. After that experience, it seems that he no longer felt such services useful and developed a strategy in which he reappraised his personal "motto" and vowed to control the things that were in his power to control. Again, it is important to note the cognitive processes displayed by participants and the amount of work required of them to buffer their core identity and sustain themselves.

One of the lessons that my dad told me when I was really young...he used circles as a metaphor and said only worry about the things that are in your circle- the things you, personally can change. And then things that are outside of the element, there is no point in worrying anyway. I can't change the people that have negative stereotype against me but I can use the resources that are given to me. It is like a life philosophy I try to live by. The only problem is that my circle is getting bigger so I am getting more stressed because now I can actually affect my life a lot more than I could when I was, say, 8 years old. That is the only thing.

This participant went on to describe that in terms of social justice issues, “I would say that is outside. I mean I guess I could make it inside, but I am not too emotionally...my heart isn’t too into that issue so I’ll just keep that outside. I would say the other stuff pushes it to the side a bit.” This represents a buffering strategy because etc....

## **Section II: Interactional Level Persistence Strategies**

Consistent with extant literature on students of color, participants sought connection with same-race peers in order to find support and respond to racial microaggressions. Yet this literature portrays somewhat of a linear progression, in that individuals experience racial microaggressions and then find same race peers. On the contrary, this required institutional intervention in the form of the minority retention program (described in the previous chapter) by connecting this group of young men with other students of color through course clustering. Once grouped, participants sometimes failed to find connection with same-race peers because of differences in extent to which ethnically identified as Mexican or Latino. Issues of ethnic authenticity were a barrier to community building with same raced peers. This trend was more common for later generation Latino students than for the 1. 5 and 2<sup>nd</sup> generation participants. For example, later generation participants described being slightly uncomfortable participating in some ethnic-based student organizations because they were not seen as “real Mexicans.” He said: “There are varying levels [of ethnic pride/belonging]. In Chicano/o student organizations like M. E. CH. A. They are very prideful. They are like ‘Aahh Mexcio!’ I am like oh it is great. Pride. Yes.” He was not against participation in this groups, but these spaces definitely made him more aware of his later generation status. He went on to describe:

*I don’t really feel connected with a Latino community here. I didn’t really in high school either. I guess my friend group was really diverse. I was really involved*

in the football team and student government and that was also really diverse. Like when I got here that was one of the things that I really wanted to do but never got the chance to do. So I don't feel like I was a part of it and then got disconnected. I just feel like I've never been a part of it.

This particular participant struggled to find connection with other Latinos on campus. Later generation students found connection with other, non-Latino students of color when they faced rejection or dissatisfaction with Latino friendship networks and groups. Early generation immigrant students found connection on the basis of language and shared experiences in having immigrant parents, and were more likely to find support in ethnic organizations that were comprised primarily of children of Mexican immigrants. Such findings suggest that we may be over-emphasizing the extent to which *all* Latinos find support with same-race peers. Indeed, many Latino engineering students shared experiencing a lack of connection with other Latinos and a desire for greater (facilitated) cross-cultural engagement.

**Cross-Racial Interaction.** All students desired cross-racial interaction because they recognized the need for social and cultural capital. They bridged with the environment as needed to connect with racially dissimilar peers. But they also buffered the negative effects of the environment by finding connection with other same race peers. Some had to buffer themselves from same-race peers by drawing connection with other students of color on campus or become invested in issues of social justice. One participant described a desire to interact with diverse peers and engage in issues of social justice, diversity, and campus climate. He stated:

When I go to a [students of color student group] thing, it's more like one group and you talk about all the social issues, like LGBT issues...I really like that though because that is a super open forum. The vibe that I got from some of the

things in MRP is that ...because the groups are Hispanic, Blacks, and Native American and in [students of color student group], there are Asians, Indians, and Blacks. Because we have this retreat at the beginning of the year and you spend all Saturday hashing out these issues and current topics and things like microaggressions, like when people say, 'that's gay' or 'that's ghetto.' I forgot where I was going. But yeah, that's what [students of color student group] is all about. *I liked it because it was more people like me.* I was struggling to find a friend who reminded me of my friend from high school, where it was pretty diverse. We all liked hip hop and art and things like that. I just never really got that out of [Minority Retention Program].

Interestingly, this participant identifies other Latino engineering students as more dissimilar than the other students of color in his student group. Yet another participant described gravitating toward non-engineering Latino organizations. He said of his desire for interaction with diverse peers:

That is why I go to M. E. CH. A and other Latino student groups. I didn't want to just stay involved in engineering stuff because I wanted to meet other people. I feel like you have to. You can only network with people in engineering so much and you need to expand your horizons. I don't know sometimes it is just kinda drags on talking with engineering people. They are great and all but I need different types of people to meet.

The desire to engage with other Latino students is consistent with extant literature that indicates this is a behavior done to buffer from a racially hostile campus climate. Others expressed a desire to connect with other students who were not Latino, either because they felt disconnected

from Latino peers or recognized the resources available outside of their communities. For example, one participant who had lived on a “Latino floor” in the residence halls, described both a connection with his Latino floor mates but also a desire to connect with peers from different backgrounds. He described:

It’s basically a freshman floor in the dorm for Hispanic kids... I was like screw it, I don’t know anything about housing so I’m just going to go there. Do I regret it? A little. Was it fun? Yes! Because I felt like I was just in the same... Same environment...a bubble. It was cool but I already knew everything about where I come from, my background I guess. I was trying to expand and know different things. Yeah I see other kids who love it. They’re all about it. I kinda grew out of it in like the first month and it wasn’t just me. Some of those people are some of my best friends [but] I could have done and I still could have known these people. I knew this guy and he would hang out there and he lived at another dorm. He was on another floor but he knew and he met other people too. That’s a great strategy. I didn’t see that. There were other kids that were just all about it and they just stay in it. By all means, go for it. My case, I started seeing the same as where I came from. They were really cool but after that I was like I have to join something else that’s not just that...

Other participants emphasized the need to make friends outside of their racial/ethnic group because of their underrepresentation in engineering. One participant stated:

I think another thing that helps me is meeting someone of a different race. I know even if they are not Latino, once I know someone in that class, I am like ‘hey let’s be friends.’ As long as I don’t feel completely alone as well. You know PUC has



large classrooms, you probably will not know everyone in your classes. So I try to make at least one friend in that class, whatever they are, whatever they happen to be, so be it. So when I have a feeling of 'oh MRP is not here, I feel alone,' I have at least one friend. They also keep you up in the class if you are trying to be lazy. I am like 'I don't care where you are from or what you have experienced. We are both inside this classroom right now and I am fine with that. I just need you for now.' For me, I guess I just grew up seeing a lot of the same... because I went to schools that were all Latino or all African American. Majority minority. That was about it throughout all my school. So I hardly saw any Asians or Anglo Whites, so for me it is interesting to learn about other people through being friends. I don't care what you are I am just interested in getting to know you. You can share your experiences and I will share mine and they might be different or they might be the same like some friends have immigrant parents but they are Asian but they understand what it is like to have immigrant parents so we have a connection there. We have immigrant parents. When it comes to sometimes forgetting the native language, I can relate because they might not be comfortable speaking Korean, Chinese. So no matter what, we might have something in common. It just helps me feel comfortable around those that are of a different racial group. The thing with White students, I'm sure there is something. Maybe we both had crazy parents, I'm sure there is something. You can't assume they are privileged in every sense of the way. There is many different similarities that we might have so it is all a matter of first getting past that 'hey they don't look like me.' Getting past that small, or big barrier, however you see it. Like hey, '

you seem like a great person to know. Let's be friends I don't care what you look like. Once we get that and start learning about each other we have more similarities than we thought. But yes, first getting past that 'you don't look like me.'

The demonstrated desire for cross-racial interaction counters a prevailing assumption that altogether students in STEM are not interested in engaging with diverse peers. It seems rather obvious that the desire for cross-racial interaction is present but that there are limited opportunities to develop skills to engage with diverse peers, let alone tools for engaging with one's own experiences with race and racism.

**Family Interdependence.** Based on extant literature on Latino college students, one might predict that participants would have relied on families for support, primarily in terms of socioemotional support. Yet participants had limited direct engagement with their parents and families. Family interdependence was a factor in their pre-college experiences but not so much for their college experience. Participants frequently stated:

I don't go home often. I go at the most five times per year. They don't know my struggle. They don't realize my struggle. They don't see that if I really wanted to pursue this and work in the medical field, I can't just sit around. They don't know that I am at a disadvantage. Even though I am at a disadvantage, I will get there. It will just take me a bit longer to get there.

Another participant said:

Well I guess every once in a while when I call home or they call me they will ask how I am doing in my classes, if I am having difficulty with a subject. Just emotional support I guess. There is not really much you can do from San Diego.

Just the fact that they ask me how I am doing make me feel better. For me, my family is the reason why I want to make sure I do well in school. So if I have a family of my own I have financial stability and stuff like that. Just thinking about that and asking about how I am doing that helps me.

While it is true that parents and families did not exchange support *directly* with students, it is undeniable that parents played a role in motivating students. For children of immigrants, the idea of making their parents proud or affording their families some degree of upward social mobility was a critical factor in their persistence. For later generation students, some of whom had college educated parents who were engineers themselves, parents were able to provide support, encouragement, and suggestions for engagement on campus. Ultimately, it wasn't the action of the parents in college that supported them. It was the struggles that parents went through and continued to go through that motivated and inspired them. For example, this participant's statement is representative of what almost all 1.5 and 2<sup>nd</sup> generation students said:

I think part of it is looking at my parents and wanting better for them and for me. But at the end of the day I think it is more of a personal thing. It is a personality base. I think if I were to graduate and get an engineering job. The fact that I would graduate it means more to them. Like my friend graduated and now he has an engineering job and is living out his dream. Of course they want me to and don't know how to achieve it. More than anything I think it was me realizing that I didn't know I wanted it.

Other children of immigrants cited their parents' experiences with struggle as the main reason why they needed to be successful in engineering:

I know we are known as hard workers, in the sense that Mexicans, a lot of Mexicans from Fresno work in the fields. A lot of Mexicans in Fresno are custodians, mow lawns and are hard workers. *They bust their ass every day all for minimum wage. I would take that same work ethic and apply it to my career or you know I might not be the best engineer but I am definitely going to bust my ass every day at what I do.* That is the work ethic that was implemented that I saw my parents show.

For those whose parents were college educated, they also inspired them to be a positive change for the Latino community. Their parents had imbued them with both support and inspired them to succeed, not just for themselves or their family, but to benefit others in society. In other words, later generation participants with college educated parents were also inspired by their parents, not only to achieve upward mobility, but to pursue a field of interest for the love of learning something that could help them give to society. For example, one 3<sup>rd</sup> generation student described his dad, an engineer, as a primary source of inspiration to give back to the Latino community despite not feeling entirely comfortable in Latino student organizations. He said:

MRP is really connected with the [Latino students]. My dad is really into that, especially [Latino engineering student group] because he is part of it and ever since he graduated he has been really involved. Now he goes back to [his undergraduate institution] and talks to the group. So he has always wanted me to do that because he goes to tons of elementary schools and teaches magnets and motors and he goes back to high school and tutors math. *He always says 'Mijo, you need to give back. Try to give back to your community.'*

Another student, whose dad was also an engineer, provided him with emotional support and also inspired him to become an engineer. When asked to identify a primary source of support, this participant stated:

I feel like mostly the role of my dad as being a Latino engineer. I guess it's not like explicit, like 'you can do it as a Mexican' but it feels like that, kinda. I've always gotten encouragement from him. I always had that, especially in sciences. My mom was always encouraging about everything in general, but my dad was really like a sciency kind of guy. He would call me before midterms and be like 'give 'em hell' and stuff like that. Especially because it's engineering. He's always been that positive influence for me. That's what he did. I remember when I switched [engineering majors], I felt a little bad because I was like 'I hope he is not bummed that I'm not doing electrical anymore', but he was like 'okay.' I mean he didn't say, 'as long as you stay in sciences' but that's kinda what he meant, as long as you're doing something like that. He is all about prove your intelligence in that area of sciences.

### **Section III: Institutional/Environmental Level Responses**

Institutional/Environmental level responses are conceptualized as those in which participants interacted with campus or society more broadly. The primary response in which participants engaged with the campus-level environment involved their decisions around using campus resources. A broader, societal-level response involved participants' desire to pursue social change for the Latino community.

**Utilization of Campus Resources.** Despite being stigmatized by their participation in minority retention programs, participants didn't let this stop them from taking advantages of the

resources they knew would help them to succeed. This was conscious and strategic and involved processing what their membership or participation in these programs would mean, for themselves and how others would perceive that participation. In other words, existing literature on affirmative action stigma indicates that students of color are often stigmatized because they always feel that they don't belong, and always question whether they were admitted to an institution based on their merits or based on affirmative action. This has been fodder for opponents of affirmative action, essentially positing that students of color are “damaged” or harmed by affirmative action. This study demonstrated that they were not harmed by affirmative action- the programs provided critical and crucial forms of support that directly translated into academic success- and it was peers’ comments that were potentially damaging. In order to not be damaged by these comments, they buffered themselves from these comments. Support from other Latino students helped students to reframe their identities in a more positive light and protected them from negative stereotypes. For later generations, social class differences and issues of ethnic authenticity complicated participation in minority retention programs. One participant described experiencing differences with MRP peers, which didn't threaten his persistence, but complicated his belonging within the Latino peer group in engineering. He stated:

It feels weird to be placed academically because then there are those differences that can come out when you are hanging out. We are hanging out through [Minority Retention Program] and it's clear that you are a generation ahead, because your college went to college. And they're like 'oh you're rich man, cuz your parents went to [college]' and then it feels weird because on the other end you get all these comments like 'oh you get all these advantages, you get to go in

the [Minority Retention Program] thing because you're Mexican. ' It's weird and I just prefer to not deal with it at all.

Here, this participant, a 3<sup>rd</sup> generation Mexican-American student with college educated parents, described being essentially teased by peers within the minority retention program for having “rich” parents and participating in a program designed to promote Latino retention in engineering. He also faced scrutiny by non-Latino students who felt he was gaining an unfair advantage through his participation in the MRP. Thus, he was dually criticized by same-race and non-same-race peers who stigmatized him for receiving benefits he did “ not deserve.”

This participant's way of dealing with the stigma was to not tell others he was a part of the Minority Retention Program (MRP) as a way to buffer himself from these kinds of comments from peers. While this participant utilized MRP in his early undergraduate years, he went on to remain affiliated with the program but chose not to utilize its support services, demonstrating that like organizations, individual boundary setting changes over time depending on need: “I haven't really been involved since my freshman year in it. It was helpful but then some parts of it started to feel not as useful.” Other students also chose to deny their participation in minority retention programs while discretely taking advantages of the benefits available to them.

**Transformational Impetus.** Participants expressed a desire to transform, or a transformational impetus, based on their experiences with racism and discrimination. Participants were motivated to change conditions so that more Latinos could be represented in STEM fields. Participants who demonstrated this desire to transform indicated that their pursuit of engineering was somehow going to be a vehicle for social transformation. Three later generation participants talked about social change and using their engineering degree for civic

engagement and social justice. For example, one participant described his pursuit of engineering as a way to improve educational opportunities for others through philanthropic work. He stated:

My main goal in life [is] to be a philanthropist. To be an engineer I want to do it, I know I want to do it but that is not my main goal. I wanna give back. That is my main goal. Yes it is never about yourself. The thing is that people will think about themselves, like I need to invest time in myself. Yeah you do. Make time for yourself, do well in school, and things like that. But overall you need to help other people; otherwise people aren't going to help you. Some people just care about people and want to help them. I want to be one of those people. Other people are just there to make money. I am like 'why are you in engineering then?' You are just here to make money. They do pay a lot. But shouldn't you be helping people too? That is also my concern with people that are going into engineering- they just want to make money. That is a bad motive to pursue something. It really is. That is all types of bad. If you want to pursue something, you have to pursue something that you would take no money for. ... There are those people that are in it for the money. I can't really do anything about that. I can only do so much to try to change their minds and turn their ideas around but in the end some people are in it for the money and some people are in it to genuinely help people.

This participant acknowledges that money can be a motivating factor in choosing a career path, but he emphasizes the need for one to choose a career that can be used in the service of others.

Similarly, another participant described his frustration with the lack of Latinos in engineering at



his institution and advocated that his institution do more to retain students of color in STEM fields. He said:

Admissions is getting worse and worse for engineering. The reasons are mainly like money. That is reasonable. It is very expensive to come here. I am fortunate to have a full scholarship to come here so I am not worried about that but my concern is getting more people drawn into [this institution] that have the minority background. Have them come here when this school is clearly not funding them enough to get those people in. Yet when they are admitting these people but not fully supporting them. Yet you have football players who go to school for free...we might actually have a future and change the world and do stuff for the good of the world but it is not recognized as that. That bothers me a lot.

[Minority Retention Program] is the primary source of support. Yeah, there is one thing that supports us and that is what keeps us together. The thing is we are not getting enough support though. . We need more support from admissions and stuff like that, the school in general. Honestly I don't know the answer but there is something missing that could help us get more Latinos into engineering. There is something missing but I just can't pinpoint out what. Honestly there are a lot of factors that I think go into this. I think it has to start with parents of those children. Also, how the schools perceive the students. Like 'oh they can't do that so we are just going to let them do these classes instead of the higher classes,' which is how I was perceived in my high school. It was 'oh you are Latino, why are you taking these classes?' Does that mean something? No, it shouldn't mean anything! It definitely upsets me. I don't culturally identify myself as Latino but

it still upsets me that these people that have so much potential in becoming engineers and wanting to become engineers or just even doctors and stuff like that in the STEM fields. It just upsets me that they are still not getting support throughout the years from k-12 from family, schools, and [Latino Engineering Student Association (LESA)] tries to help with that and tries to show them that pursuing STEM is great. There are so many opportunities for you to do it and it is not impossible. A lot of the stuff we do through [Latino student organization] is outreach to K-12 just to get that awareness that it is not impossible. Look at us and we are Hispanic and Latino descent and we are going to work at Boeing and Northrop, NASA. We are doing all of these amazing things and you can do that too.

Thus, participants who demonstrated an understanding of racism as interactional, ideological, and institutional also described a desire to effect social change. In other words, some participants described experiences with direct racism (e. g. stereotypes) and others described racial inequities (e. g. schooling inequities). Those with an awareness of the latter also expressed a desire to transform society. This was more common among later generation participants. For example, when the participant above described his participation in outreach efforts, he talked a lot about giving back to the community. And yet this participant didn't feel a sense of belonging to the Latino community on campus. When I asked why he was eager to give back to a community to which he felt that he didn't belong, he said:

It is because I am not fully part of it that I am able to understand it and realize that we need more Latinos in engineering and we need more support. There is so much to it. I mean, yeah. You have had to do stuff and be smart, obviously. But

that doesn't mean that if you didn't get in, that you are stupid. People who did not get into engineering are not stupid. Clearly you can go to community college and then transfer into engineering. We support that too. We try to go to community college students in the LA area and try to get them to do STEM, mainly Latino people because that is who the outreach thing is for.

This participant also went on to describe himself as an advocate for his community. When asked whether he sees himself as an advocate for his community, he said:

Absolutely. They deserve those same privileges as much as I do. The stuff that I am getting or the education that I am receiving- they deserve it just as much as I do. However, they do need to realize that it does take some work to get there. Some people are just like 'eh. . I don't want to do work' and stuff like that and if they don't have the mindset to work hard and of getting to a goal, or a certain ideal career that they want to do, then I don't want to be...I guess wasting my time with those people. I want to make sure I am getting the word out that this is possible for you but I want to make sure that I am reaching out to people that do work hard and do realize it does take hard work to get there. I do want those people to realize that you might be a little bit lazy and do need to push yourself if you do want to get there and do want to do this.

Thus this participant exemplified a desire to transform, or transformational impetus. This was a desire to promote social justice and use engineering as a vehicle for social change. Such a desire to transform was observed mostly among later generation participants, presumably because they have had prolonged exposure to U. S. institutions and a greater awareness of structural inequities. Perhaps nowhere was participants' desire for social change more evident than in their

participation in this study. They were offered no monetary incentives for participation but cited a desire to help others as a reason for participating. As one participant stated, "If you have the time and are willing to help someone, then take the time to do it. If someone has helped you, then take the time to do it. Like I saw your flyer and got an email about it and I figure if this dissertation could help other Latinos in engineering then why not take the time to do it, just an hour of my time." A key aspect of this idea of a transformational impetus is that it is born of struggle. Though participants were inconsistent in naming what this struggle was, it came down to race and social class.

I didn't want to be engineering. Now that I am here I realize it is what I want to do. In order to do this I have to pick myself up because I can't just give up because in life, if people gave up they wouldn't have gotten as far in life as they wanted to. I'm pretty sure you know a lot of people who have been successful. So the way my friend who is African American, he is the one I have struggled with for most of these years with. He tells me that most of these people they don't know what struggle is. When they first encounter it they are not going to have the skill set to deal with it. Whereas I have already had to struggle and look at myself in the mirror and know that I am not the type of person to give up. So when I encounter struggle, I am not going to be. I am willing to work hard to be able to overcome challenges. So no matter what they are going through in their lives they are going to give up at the first sign of struggle. It is easier to find Latinos in engineering, but his struggle is different in the sense that his ethnicity can play a role in it. Being Black versus being Latino...he has struggled with not

being Black enough for his community. It is like me not being Latino enough for my community.

### **Chapter Summary**

These findings counter prevailing assumptions that Latinos represent a homogeneous student population and that their persistence strategies among are “nonacademic” or devoid of cognitive processes. This was likely not the intended implication of research by Tracey and Sedlacek in referring to these strategies as “noncognitive persistence strategies.” In calling the strategies nonacademic, there is an implication that these strategies occur outside the classroom and do not explicitly identify them as cognitive strategies for reconceptualizing racially hostile contexts. As this chapter demonstrated, strategies of cognitive racial reappraisal occurred inside and outside of classrooms as individuals moved through social contexts.

Findings indicate that participants were racialized differently in the broader campus context and the engineering context. Within an engineering context, participants experienced stigmatization as a result of their participation in racial minority retention programs. Responses to such stigmatization resembled the organizational behaviors of *bridging* and *buffering*, in that participants engaged with the environment to take advantage of available resources but managed to buffer themselves from negative elements of the environment (e. g. racial discrimination, stigmatization, stereotypes) through a variety of what can be referred to as *cognitive racial reappraisal persistence strategies*. This study suggests that not only is “understanding and ability to deal with racism” important in the way it may potentially shape engagement on campus, more specifically, by influencing individual behaviors and decisions to access campus resources. This study expanded what “ability to deal with racism” means and emphasizes that responses are important to persistence. Understanding of race and racism may be an important in

mediating structural diversity and interactional diversity, that is, the extent to which and ways in which individuals interact with diverse peers.

## **Chapter 8: Discussion and Implications**

This chapter will summarize information about the study and key findings. I then proceed to a discussion of specific aspects of the study that warrant a closer look. Lastly, I offer a description of potential implications for research, theory, and practice. The purpose of this chapter is to conclude this study and suggest direction for future scholarship.

### **Section I: Review of the Study**

This study focused on exploring noncognitive persistence strategies among Latino males pursuing engineering degrees at a private and public institution in Southern California. Specifically, this study explored the noncognitive persistence strategy of understanding and responding to race and racism. The purpose was to extend our understanding of this strategy that was initially considered by Tracey and Sedlacek (1984, 1985). This study centralizes students' subjective experiences with race and racism to explore the following research questions:

- 4) How do Latino male engineering students understand and respond to race and racism?
- 5) How might Latino male engineering students' understanding and responses to race and racism differ by immigrant generation?
- 6) How do Latino male engineering students' understanding and responses to race and racism shape persistence?

To answer these questions, a total of 37 semi-structured interviews were conducted with students who identified themselves as being of Mexican or Central American descent, male, enrolled full-time in an engineering program at one of two institutions, and have completed at least one academic quarter or semester. Most participants were children of Mexican immigrants from low-middle income households. Of particular interest was uncovering key differences in understanding and response to race and racism by immigrant generation.

This study extends higher education literature on persistence of underrepresented racial minorities (URM) students in STEM fields by (a) providing detailed information on how students' understanding of race is fundamentally informed by their immigrant generation, (b) describing the social, cultural, and political contexts that shape responses to racism, (c) exploration of challenges and strategies faced by Latino engineering students, specifically related to social identities, (d) exploration of the responses to race and racism students employ to not only persist toward degree completion but to thrive and serve their families, communities, and broader society.

## **Section II: Summary of Findings**

There are several findings that resulted from this dissertation study. These were described over four separate findings chapters. Collectively, the four findings chapters were focused on identifying how participants understood and responded to race and racism; immigrant generation, ethnic identity, and were central to the discussion. Chapter 4 described findings regarding participants' pre-college educational experiences. These experiences provided students with at least a cursory understanding of educational inequities and differential educational opportunities. Participants were aware that they lived in "bad" neighborhoods and that resources at their schools were more limited than those in more affluent, White neighborhoods.

Chapter 5 described the ways in which participants talked about their ethnic identity, which revealed information about their understanding of themselves as members of a racialized group. Some participants struggled to find the language with which to describe their ethnic identity, they're feeling of being neither American nor ethnically Latino enough. Others proudly proclaimed their ethnic identity and expressed a deep connection to their ethnic group.



Ultimately, participants' descriptions of their ethnic identity revealed a reluctance to engage with "identity politics" and a denial of the salience of their racial identity. Moreover, negative perceptions of early and later generation counterparts highlighted within group differences among this group of Latino engineering students. Ultimately, complicated experiences in being racialized shaped how participants responded to racism in college.

Chapter 6, described students' understanding of race and racism in college context and identified the mechanisms that made race salient or not as students moved through various institutional contexts. One of the primary mechanisms by which race was made salient to participants was through their participation in racial minority retention programs. Key institutional differences were revealed in terms of how these programs were structured. In the context of the very structured program, participants were grouped together as an incoming engineering cohort and provided academic resources. In taking advantage of being part of the retention program, participants were stigmatized. Finally, chapter 7 highlighted students' responses to race and racism and proposed a model for understanding such responses as cognitive racial reappraisal strategies. What follows is discussion of findings to guiding research questions, including further discussion of cognitive racial reappraisal strategies.

**How did participants understand race and racism?** This study found that participants' pre-college experiences provided them with a stratified view of educational opportunity in the United States. Students carried this understanding with them into the college context, where their educational disadvantage was amplified by peers with access to high quality math and science curriculum in high school.

It is important to also point out that participants sometimes struggled to make meaning of their experiences and to find the language with which to describe their experiences. In fact,

some participants used culturally deficit language reflective of broader discourse in society about Latinos. In other words, participants sometimes offered descriptions of their Latino counterparts that appeared to be largely informed by negative stereotypes about Latinos in society. While this was certainly not true of all participants, it was concerning to hear. Such a finding suggests that students are not being provided with sufficient opportunities to explore their social identities, especially race. Ultimately, what was most striking about participants' description about their beliefs of race and racism was the simultaneity of their denial of the significance of race while grappling with racially motivated incidents and racializing experiences.

**Differences by Immigrant Generation.** It was interesting that participants, whose immigrant parents had experienced some level of upward mobility while living in the United States, did not view educational stratification or limited educational opportunities as insurmountable. Indeed, early generation students seemed to minimize the extent to which race shaped educational opportunities in America as well as the extent to which race was any factor in their own life. In other words, race was understood as something that could potentially shape one's life, but early generation students saw this as minimal if one works hard to achieve success. Later generations emphasized structural barriers to higher education and, though they too succeeded in light of educational disadvantages, were less willing to attribute hard work to their success. Early generations minimized the significance of race in shaping educational outcomes and emphasized meritocratic ideals while later generations offered greater level of awareness of structural inequities. Thus, immigrant generation shaped understanding of race and racism insofar as it provided students with an ideological context and had implications for ethnic identity.

**Institutional Differences.** Institutional differences were observed in terms of how participants were racialized. At one institution, participants were racialized through their participation in a structured minority retention program. Indeed, participants attending the four year public institution were stigmatized by peers who perceived them as benefiting from unfair educational advantages. In the context of the private institution, participants did not frequently take advantage of minority retention services that were available to them. This less-structured model meant less affirmative action stigmatizing from peers. There was good and bad to both models. The public institution model allowed for cohorts of students to build friendships early on and to take classes together. Although students at the private institution did not have a cohort model available to them in engineering, they expressed greater interest in cross-racial friendship and interaction. Arguably, because these students did not have a cohort model in which they could rely on Latino peers, they were better able to engage in and articulate the importance of cross-racial interaction.

**How did participants respond to race and racism?** These findings counter prevailing assumptions that Latinos represent a homogeneous student population and that their persistence strategies among are “nonacademic” or devoid of cognitive processes. This is likely not the intent of research by Tracey and Sedlacek in terms of them referring to these strategies as “noncognitive persistence strategies” –in calling the strategies that they were more so emphasizing that these strategies fall into the realm of being nonacademic, and strategies that students engage in outside the classroom. But this study demonstrates that the strategies span contexts because it is across contexts that participants were racialized, albeit differently. Findings indicate that participants were racialized differently in the broader campus context and the engineering context. Within an engineering context, participants experienced stigmatization

as a result of their participation in racial minority retention programs. Responses to such stigmatization resembled the organizational behaviors of *bridging* and *buffering*, in that participants engaged with the environment to take advantage of available resources but managed to buffer themselves from negative elements of the environment (e.g. racial discrimination, stigmatization, stereotypes) through a variety of what can be referred to as *cognitive racial reappraisal persistence strategies*. Cognitive racial reappraisal persistence strategies are comprised of the bridging and buffering strategies that allow racialized, minoritized students of color to protect (buffer) themselves from the negative aspects of a racially hostile college environment while simultaneously accessing (bridging) that same environment for the resources on which they inevitably depend. Such strategies may limit interaction and expand interaction with the environment as needed in order to attain needed resources. These strategies are deemed necessary by virtue of the nature of the college environment in which students of color experience racial hostility yet are dependent upon for resources. Collectively, bridging and buffering strategies represent an attempt of individual to protect a core academic identity as well as to redefine for others and/or themselves a socially constructed racial identity.

**Differences by Immigrant Generation.** Immigrant generation shaped the level at which individuals felt they could enact social change. Transformational impetus/social justice imperative more common among later generation participants. This is significant because we often ignore later generations of Latinos, particular Mexican-Americans. Yet, later generations Mexican-Americans have valuable historical knowledge of responding to race and racism in the United States that should continue to be explored, particularly in the context of education.

### **III: Discussion**

**Race and Racism.** The treatment of race and racism in extant literature on URM in

STEM has been limited in several ways. There has been an emphasis on increasing URM participation and degree completion to ensure U.S. economic prosperity and global competitiveness without sufficient recognition of a deeply rooted legacy of racial exclusion and oppression that continues to negatively shape educational experiences and outcomes for communities of color. Discursively, the disparities in degree completion rates between underrepresented racial minorities and their White peers have been framed as a national concern only insofar as it pertains to and threatens White economic interest (Bell, 1979; Delgado & Stefancic, 2013; Palmer & Wood, 2013). As Mills describes, a system of global White (economic, social, and moral) supremacy fundamentally requires the exploitation of non-Whites, and thus “requires in Whites the cultivation of patterns of affect and empathy that are only weakly, if at all, influenced by non-White suffering” (p. 95). Thus, attention to racial minority students is rooted in the interest of maintaining global (White) supremacy and not redressing racial inequity; subsequent efforts to promote their advancement in STEM fields have been, at best, superficial and, at worst, reifying of deficit perspectives of communities of color.

A limitation of research on URMs in STEM is that when race is considered, it is most often represented as a background variable with static meaning and consequences across contexts. This suggests that the nature of race is such that it is fixed and predictive rather than something constructed as individuals move through unique ecological contexts (Kendig, 2011). Furthermore, the significance of racism is minimized by general comparisons of perceptions of discrimination among White and non-White students. This serves to obscure the unique challenges students may face that are specifically informed by their racially minoritized status.

Finally, while important work has been done on Black students’ responses to racism and resilience within STEM (e. g. Harper 2010, 2013; McGee & Martin, 2011a, 2011b) there is

much less literature documenting the ways Latino students specifically experience and respond to racism in STEM fields. Broadly, research on Latinos in STEM has largely grouped them with other racial minority students, while studies focused specifically on Latinos tend to focus on identifying factors that negatively or positively affect their academic success in STEM rather than their more subjective experiences and responses to race and racism (e. g. Cole & Espinoza, 2008). Indeed, there is a much more limited portrait of resilience and success for Latino students than for Black students, likely because Black students are treated as a racial group and Latinos an ethnic one. Though “Latino” is not a racial category, individuals from different ethnic backgrounds that comprised the “Latino” category are prescribed a racialized status in American society, thus, their understanding and responses to race and racism should be considered in the context of STEM persistence.

**Redefining Success in Engineering.** Findings from this study suggest a need to reconsider what it means to be successful in engineering. Participants were not only faced with academic challenges associated with their field of study, but they engaged in cognitive racial reappraisal strategies to promote their persistence. For them, success was not only defined by the extent to which they were academically successful but also by their ability to improve the lives of members of their family and members of their home communities. Individual success was tied to people whom they cared about, inherently and undoubtedly. This was both a blessing and a burden in that the added responsibility both motivated and challenged them.

In addition to success being defined by participants as collective rather than individualistic, participants also emphasized that academic success in engineering equates to more than degree completion. It was concerning that participants were made to feel worthless if they had less than a 3.5 grade point average. Success in engineering was completing a degree

with a GPA above 3.5 and securing a selective industry internship. Participants consistently emphasized that success in engineering is not just about persistence to degree completion but about coming out of their program with an internship at a selective company and having a 3.5 or above. Basically they were told that they were nothing if they did not have a good GPA. Students sometimes don't see a reason to persist if they know that they will not be hired because they barely graduated. They struggled with this- feeling like their programs emphasized high GPA rather than love of learning and wanting to make a positive change in society. In light of the demands for a high GPA, they attempted to achieve a high GPA by themselves emphasizing a connection to society. Again, this was a cognitive process in which they reframed the sociocultural meaning of a GPA- a high GPA represented ability to more meaningfully contribute to society via access to prestigious and lucrative positions.

**Expanding the Definition of Resistance.** We typically think of resistance as being associated with a typology of the “activist”- the student with high levels of engagement on the broader campus. But for STEM students, this is not the type of activism they do. Their way of actively resisting is get themselves through, however they can. They buffer themselves from external influences to protect their core engineering identity. In doing this, this is resistance and activism because they feel their participation in engineering and becoming an engineer represents social mobility for themselves. There were differences in how students thought of social change. Early immigrant generation students saw change in terms of them being role models for their community and for helping their parents, some of whom were undocumented and still working in the fields. The later immigrant generation students seemed to espouse a broader understanding of social change and advocated more explicitly for social, education, and racial equity in society.

This information potentially informs the notion of resistant cultural capital and community cultural wealth. It adds transformational impetus (expression of resistant cultural capital). It demonstrates the validity of the assumption that there is something to be said about blessed by a burden. There does seem to be some validity to the assertion that some individuals respond tremendously in the face of oppression. This study proposes that individuals engage in cognitive racial reappraisal strategies- the work they do of bridging and buffering- it is deliberate, strategic, and involves high levels of cognition and reappraising their racial identity and value.

#### **IV: Implications**

**Community Cultural Wealth.** I learned from this study that traditional forms of capital are very much at play. MRP tries to instill networks of Latinos and people of color to provide forms of social and cultural capital because White and Asian networks are so-often established and so-often inaccessible. I also learned that these students also display forms of community cultural wealth. However, community cultural wealth may be mediated by ethnic belonging. Persistence is shaped by resilience as it is expressed via capitals that are mediated by ethnic identity and understandings of race and racism.

**Co-Ethnic Support.** Findings indicate that as a result of limited access to co-ethnic social networks, students felt an added sense of belonging beyond that begat by a racially hostile campus climate. Respondents identified a campus that was almost ethnically hostile in which no one understood them and they felt very much alone. That students looked both to White student populations as well as Latino ethnic student organizations suggests something critical: they are simultaneously denied access to traditional forms of social and cultural capital as well as non-dominant forms of capital. One thing to consider as well explore the forms of capital students of



color possess that are not valued in traditional schooling contexts is the extent to which possessing those forms of capital is predicated on a level of ethnic cohesion. When we assume that Latinos navigate higher education by drawing on resources within their communities, we must clearly define what those communities are and who gets to be a part of them. This study teaches researchers interested in educational experiences and outcomes of Latinos to pay careful attention to Latino heterogeneity and potentially differential access to forms of social and cultural capital.

**Leadership capacities in STEM.** In higher education we encourage participation in minority retention programs designed to promote the persistence of students of color. This dissertation study showed that, indeed, participants benefit tremendously from such programs. However, participants' discussion of race/ethnicity reveal a limited understanding of why these programs exist, the sociopolitical context of race/ethnicity, and in fact harbor negative and cultural racist beliefs about why Latinos are underrepresented in STEM fields. They simultaneously experience racializing experiences, sometimes hostile, and yet have no language or tools with which to confront these experiences. Thus our efforts to increase minorities in STEM fields, thus far, represent a superficial involvement in which they are denied access to self-discovery, discourse, and meaningful leadership as Latinos. True inclusion would mean the opportunity to pursue engineering and be culturally validated (Rendon, 1994)

**Implications for Affirmative Action.** A major theme of the study was that participants experienced stigma as a result of affirmative action practice in the form of a minority retention program. Some participants expressed concern with benefits they may receive as a result of their membership in a racial minority group. Given the significant political power of Latinos in the United States, it is important to consider that some college (STEM) educated Latinos may

potentially vote in opposition to affirmative action legislation in light of their negative experiences on college campuses. For example, participants expressed such mixed feelings of affirmative action that they might become opponents of it for other Latinos in the future. Again, it is important to provide students with an understanding of why they are recruited for particular programs and the reasons why such practices exist.

### **V. Directions for Future Research**

Several scholars have focused on resilience, success, and student responses to racialization and racism (Gandara, 2010; Harper, 2010; Solórzano et al. , 2000; Yosso, 2006). Future research should consider how more of these frameworks could be utilized in efforts to better understand experiences of URM students in STEM and promote their success in these fields. Future research should also draw on interdisciplinary approaches to understanding students' subjective experiences with race and racism.

## APPENDIX A: RECRUITMENT FLIER

### ENGINEERING STUDENTS: WHAT ARE YOUR STRATEGIES FOR SUCCESS?

Are you a male engineering student of Mexican or Central American descent? If so, tell us about the strategies you use to be successful in engineering! Your experiences will be used to better understand the persistence strategies of Latino students as well as how their educational experiences are potentially shaped by immigrant background or later generation status. This research is being conducted as part of a dissertation study by Elvira J. Rodriguez, M. A. , who is a graduate student in the Graduate School of Education at UCLA. The faculty sponsor for this dissertation is Patricia McDonough, PhD. , faculty member in the Graduate School of Education at UCLA. The study is focused on understanding the persistence strategies of male Latino students in engineering of diverse immigrant generations. To be included in the study, you must meet all of the following criteria:

- Be of Latino, Hispanic, or Chicano and be of Mexican or Central American descent
- Identify as belonging to one of the following generational categories:
  - 1. 5 generation (meaning an individual entered the U. S. as children and has spent a significant part of their lives being educated in the U. S. )
  - 2nd generation (meaning an individual is the child of immigrant parents)
  - 3rd, 4th, or later generation (meaning an individual's grandparents, great grandparents or later immigrated to the U. S. )
- Currently pursuing an undergraduate, Master's, or PhD degree in any engineering field
- Have completed at least one academic quarter or semester toward their degree
- Self-identify as male
- Speak English

If you are interested in being a part of this study, you can expect to participate in an interview that will last about 60 minutes. You will be asked to describe how you got to college, general college experiences, and strategies and sources of support that enable you to succeed in your engineering degree. For example, you will be asked whether you turn to your family support while pursuing your degree and to describe the level of involvement your family has with your life as an engineering student. If you have questions or are interested in participating in the study, please contact Elvira Rodriguez at [ejrodrig@ucla.edu](mailto:ejrodrig@ucla.edu).

## APPENDIX B: RECRUITMENT E-MAIL

Dear (Name),

Hello! My name is Elvira Rodriguez and I am a graduate student in Education at UCLA. I am conducting a study on Latino male college students who are of Mexican and/or Central American decent and currently pursuing an undergraduate degree in engineering.

The purpose of this study is to address a lingering gap in higher education literature on the persistence strategies of Latinos in engineering.

I would like to interview you about your experiences as an engineering student. Of course, your participation in the study is completely voluntary. If you would like to participate, a 45-60 minute interview could be conducted in person or over the phone. If you would like to set up an interview time or ask any questions, please contact me at [ejrodrig@ucla.edu](mailto:ejrodrig@ucla.edu) or (951) 202-7152.

Many Thanks,  
Elvira Rodriguez

## APPENDIX C: DEMOGRAPHIC QUESTIONNAIRE

Please indicate your answer to following demographic questions. You are free to not answer any question and to remove yourself from this study at any time. Your answers to the following questions will remain confidential.

1. Name:
2. Name of undergraduate institution:
3. Please specify which engineering field you are majoring in:
4. Are you a transfer student (yes/no)?  
If yes, please indicate the institution you transferred from:
5. Please identify your year in school (e. g. 1<sup>st</sup> year, 2<sup>nd</sup> year, etc. ):
6. High school attended (name, city, and state):
7. Anticipated graduation year:
8. Post-graduate plans:
9. What is your ethnic background?
10. Please share your age:
11. Were you born in the United States?
12. Were your parents born in the United States?
13. Were your grandparents born in the United States?
14. Please estimate your parental income level (circle one):
  - a. \$0- \$10,000
  - b. \$10,000 - \$30,000
  - c. \$30,000 - \$50,000
  - d. \$50,000 - \$80,000
  - e. \$80,000 - \$100,000
15. Please indicate your parent(s) educational level (circle one):
  - a. Less than high school
  - b. Completed high school
  - c. Some college
  - d. Completed college
  - e. Advanced degree (i.e.: M. A. , M. S. A, M. S. W. , etc. )
  - f. Professional degree (Ph. D. , J. D. , M. D. , etc. )

## APPENCIX D: INTERVIEW PROTOCOL

### Getting to Know You

1. Please tell me a bit about yourself.
  - a. Where did you go to high school?
  - b. How did you get to college?

### Attitudes toward Schooling

1. What made you decide to pursue an engineering degree in college?
2. How did your family feel about your decision to pursue an engineering degree in college?
3. What messages did you hear growing up about college?
  - a. Do you think college is possible for everyone? Why or why not?
4. What messages do you hear now about what life will be like after college?
  - a. Do you think an engineering degree is possible for everyone? Why or why not?

### Overall Experiences

1. Tell me about what life is like for an engineering major.
2. What are some of the challenging aspects of majoring in engineering?
3. Have you had any negative experiences in engineering?
  - a. Do you think any negative experiences in engineering you have had are related to any aspect of your identity? If so, which?
4. What are some of the most rewarding aspects of majoring in engineering?
5. What stands out as a positive experience in engineering?

### Persistence Strategies

1. What are some of the strategies that you use to succeed in engineering?
  - a. What strategies have you used, if any, to confront challenges?
2. What sources of support have you relied on to deal with challenges?
  - a. How did you know to use those strategies or supports?
  - b. Are those strategies and supports available to everyone?
  - c. How did you know those strategies and supports would be helpful to you, in particular?
3. Have you experienced any **social challenges** while pursuing an engineering degree?
  - a. What strategies have you used, if any, to confront those challenges?
4. What sources of support have you relied on to deal with social challenges?
  - a. How did you know to use those strategies or supports?
  - b. Are those strategies and supports available to everyone?
  - c. How did you know those strategies and supports would be helpful to you, in particular?

### Family Support and Interdependence

1. Who, if anyone, in your family do you turn to for support?
2. What role do you play in your family?
3. How would you describe the level that your family depends on you?
4. How would you describe the level that you depend on your family?
5. What role does your family play in your life as you pursue an engineering degree?

### Peer and Family Support

1. Who among your peers do you turn to for support?
2. What role do you play among your group of friends?

### Immigrant Background

1. How, if at all, do you think your parents' immigrant background or later generational status has shaped your pursuit of an engineering degree?

2. Do you think your parents' immigrant background or later generational status has played a role at all in your education?

**Responses to Racialized Experiences**

1. Can you tell me how you identify in terms of race and/or ethnicity? (e. g. Mexican-American, Chicano, Latino, etc. )
  - a. Can you tell me more about why you chose to use that racial/ethnic label?
2. What does your racial/ethnic background mean to you?
  - a. What does being Latino mean to you?
3. Does your racial/ethnic background play a role in your experience as an engineering major?
4. Have you ever thought that your racial/ethnic background played a role in your education?
5. What role does your race/ethnicity play in your daily life?
6. In what ways is your race/ethnicity a source of strength, empowerment, motivation, or pride as you pursue an engineering degree?

## APPENDIX E: CONSENT FORM

University of California, Los Angeles

### CONSENT TO PARTICIPATE IN RESEARCH

*Noncognitive Persistence Strategies of Latino<sup>2</sup> Males in Engineering: A Comparison of Recent Immigrants versus Later Generations*

You are asked to participate in a research study conducted by Elvira Rodriguez (Principal Investigator) under the faculty sponsorship of Professor Patricia McDonough, at the University of California, Los Angeles. You were selected as a possible participant in this study because you have expressed interest in participating and meet the selection criteria for this study. Your participation in this research study is voluntary.

#### **Why is this study being done?**

The purpose of this study is to explore the persistence strategies of Latino male undergraduate and graduate students pursuing engineering degrees at four-year universities in California. Specifically, this dissertation study will focus on *non-academic* strategies such as how students respond to experiences with racial discrimination and their relationships with family. This study addresses a gap in existing literature on Latino student persistence by focusing specifically on the role of immigrant generation.

#### **What is the criterion for inclusion in the study?**

- Latino, Hispanic, or Chicano and be of Mexican or Central American descent
- Individuals of 1. 5 generation (meaning they entered the U. S. as children and have spent a significant part of their lives being educated in the U. S. ), 2nd generation (meaning they are children of immigrants), or 3rd of 4th generation (meaning they are the grandchildren or great grandchildren of immigrants). An attempt will be made to recruit an even number of participants from each immigrant generation.
- Be enrolled in an undergraduate or graduate engineering program at your institution.
- Have completed at least one academic quarter or semester at your institution.
- Self-identify as male
- Speak English

#### **What is the criterion for exclusion from the study?**

- DO NOT identify as Latino, Hispanic, Chicano, Mexican-American, or Central American.
- Immigrant students who have immigrated to the United States after the age of 12.
- International students
- Those who are not currently enrolled in school
- Those who do not identify engineering as their primary degree objective

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<sup>2</sup> The term Latinos is a racialized category often used to define a broad range of ethnicities. This study will focus on Latinos who ethnically identify as Mexican or Central American.



- Those who identify as female
- Individuals who are not able to communicate in English.

**What will happen if I take part in this research study? How long will I be in the research study?**

If you volunteer to participate in this study, you will be asked to participate in one 45-60 minute interview at the location of your choosing or over the phone. Prior to the interview, you will be asked to complete a short demographic questionnaire. After the interview, the principal investigator will ask you if you have any questions about the study and provide you with contact information should any questions arise. Your participation in the study should take no longer than 90 minutes including interview and e-mail correspondence time.

Examples of demographic questionnaire questions include:

16. Post-graduate plans:
17. What is your ethnic background?
18. Please share your age:
19. Were you born in the United States?
20. Were your parents born in the United States?

Examples of interview questions include:

6. Who, if anyone, in your family do you turn to for support as you pursue your engineering degree?
7. What role do you play in your family? How has that role shaped your educational experiences?
8. How would you describe the level that your family depends on you for support, resources, etc. ?

**Are there any potential risks or discomforts that I can expect from this study?**

This study poses little to no risk to you. In reflecting and talking about your educational experiences at your undergraduate institution, you may become uncomfortable with unhappy experiences or with memories that you bring up. If this is the case, we can take a break and come back together, or you can choose to withdraw from the study. You can also simply choose not to answer a question that you feel might bring up bad memories or feelings.

If after your interview you have unresolved feelings or wish to speak to a counseling professional, please contact the student psychological services on your campus. Here is a list of contacts for psychological services for campuses involved in the study:

UCLA Counseling and Psychological Services:  
(310) 825-0768

USC Student Counseling Services: (213) 740-7711 **Are there any potential benefits if I participate?**

You will not benefit directly from this research project. The results of the research may provide a richer understanding of the experiences of Latinos pursuing undergraduate and graduate engineering degrees.

**Alternatives to participation**

The alternative to participation in this study is simply not to participate.

**Will I receive any payment if I participate in this study?**

You will receive no payment for your participation in this study.

**Will information about me and my participation be kept confidential?**

Any information that is obtained in connection with this study and that can identify you will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of removing your name, phone number, or any identifying information from all electronic and written records. Interviews will be immediately transcribed verbatim and you will be assigned a pseudonym which will be used instead of your name.

**Withdrawal of participation by the investigator**

The investigator may withdraw you from participating in this research if circumstances arise which warrant doing so. If it is revealed that you do not meet the requirements for participation, you may have to drop out, even if you would like to continue.

**What are my rights if I take part in this study?**

You may withdraw your consent at any time and discontinue participation without penalty or loss of benefits to which you were otherwise entitled. You can choose whether or not you want to be in this study. If you volunteer to be in this study, you may leave the study at any time without consequences of any kind. You are not waiving any of your legal rights if you choose to be in this research study. You may refuse to answer any questions that you do not want to answer and still remain in the study.

Study participants will be able to review, edit, and erase the tapes/recordings to ensure that interview data captured accurately reflects the information shared.

**Who can answer questions I might have about this study?**

In the event of a research related injury, please immediately contact one of the researchers listed below. If you have any questions, comments or concerns about the research, you can talk to the one of the researchers.

Elvira J. Rodriguez, M. A.  
Principal Investigator  
B52 Student Activities Center  
Email: ejrodrig@ucla. edu  
Phone: 951-202-7151

Patricia McDonough, Ph. D.  
Faculty Sponsor  
3042 Moore Hall  
Email: mcdonough@gseis. ucla. edu  
Phone: 310-206-2120

If you wish to ask questions about your rights as a research participant or if you wish to voice any problems or concerns you may have about the study to someone other than the researchers, please call the OHRPP (Office of the Human Research Protection Program) at (310) 825-7122 or write to 11000 Kinross Avenue, Suite 102, Box 951694, Los Angeles, CA 90095-1694.

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