RECOGNITION AND RESPECT FOR DIFFERENCE: SCIENCE AND MATH PRE-SERVICE TEACHERS' ATTRIBUTES THAT UNDERLIE A COMMITMENT TO TEACH IN UNDER-RESOURCED SCHOOLS

by

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DEDICATION

This work is dedicated to:

Learners, all deserving respect and recognition for who they are

and a just and equitable society

in which they can thrive and flourish.

And to my dear and loving boy Orion Ganchorre Abrell.

You are my constellation that illuminates my world.

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ABSTRACT

This work revealed what is at the core of a particular group of prospective teachers that underlie their commitment to teach in under-resourced schools and districts. Prospective teachers committed to teaching in under-resourced schools have qualities or attributes of *recognition* and *respect* for students and families who come from low-income and culturally different backgrounds and experiences. These prospective teachers were able to recognize complex interactions that students and their families face at the individual, social and institutional level. They also sought ways to address their students' learning needs by drawing from students' experiences to make meaningful connections between home and school. To identify students' and families' lived experiences, cultural practices, and language as resources to draw from, are acts of *recognition* and *respect* towards students and their families who are, for many prospective teachers, different from themselves. *Recognition* and *respect* for difference are essential attributes that underlie a socially just and humanistic pedagogy which can positively impact the learning outcomes for students who are historically poorly served by our public schools. This work highlights a different view that prospective teachers from majority White European backgrounds have about social others. It also provides a new framework using social otherness as a lens to reveal prospective teachers' understandings and knowledge about students and families from low-income backgrounds.

CHAPTER 1: THE STUDY RATIONALE AND RESEARCH QUESTIONS

Efforts to address the educational disparities that students from low-income and poor communities experience is a long standing goal of teacher education reform (Darling-Hammond & Bransford, 2005). To ameliorate the educational outcomes of low-income and poor students, scholars advocate preparing teachers for a just and democratic society, one that promotes greater equality, that is inclusive of all groups, racial, ethnic, cultural, social, gender, different ability or social others who have been subordinated. The overall goal is to eliminate discrimination of any one group, to transform schooling such that difference is acknowledged, and recognized as an inherent quality valued in our society (Grant & Sleeter, 2001; Nieto, 2009; Sleeter, 1989). Such perspectives are grounded within multicultural, moral, critical and social justice scholarship (Banks, 2004; Cochran-Smith, 2008; Darling-Hammond, 2004; 2010; Darling-Hammond & Bransford, 2005, Noddings, 1984; Soloranzo & Yosso, 2002). The assumption that underpins these theories is teaching and schooling occurs within a sociocultural, political and historical context in the United States. An individual's decisions, behaviors, and actions are influenced and constrained by social, political, and historical forces that advantages affluent White middle-class heterosexual able students (Ladson-Billings, 2009; Nieto, 2005; Noddings, 1984; Cochran-Smith, 2008; Valenzuela, 1999).

Social, political and institutional capital, whether material or relational, are disproportionately distributed, wherein the quality and total amount of educational opportunities in science and math for low-income and poor students have access to is less than their affluent White-European counterparts (Darling-Hammond, 2004; Oakes, 1990;

Oakes et. al., 2002). Throughout this dissertation I refer to schools and districts where this disparity exists as under-resourced. Students who come from diverse backgrounds, those who are culturally, ethnically, linguistically, and different ability learners or labeled as such, are disproportionately represented among low-income and poor populations. The educational or opportunity gap continues to persist among low-income students and diverse students compared to White middle-class students, especially in science and mathematics (Lee, 2003; National Science Board, 2010). One mechanism to achieve educational parity is to train prospective teachers to critically examine issues that contribute to the forces that uphold or lead to unjust and inequitable learning opportunities, as well as develop knowledge and skills to promote a more just learning environment (Irvine, 2003; Cochran-Smith, 2004; 2008).

In an effort to address the inequitable distribution of highly qualified teachers in science and mathematics disciplines, the National Science Foundation (NSF) supports projects to increase the number of qualified and talented Science, Technology, Engineering and Mathematics (STEM) teachers in low-income and poor districts through the Robert Noyce Scholars program. The Noyce program is a nation-wide program offered through various teacher training institutions in the US. At the institution where this study was conducted, the Noyce program provides forgivable loans for undergraduate science and mathematics majors who commit to teaching in districts that are under-resourced. Districts are under-resourced if they meet one of the following conditions: a high percentage of students in the district qualify for the free or reduced price lunch program, a high percentage of teachers are teaching out of their major field of

studies, or the school district has experienced a high teacher attrition rate in the past three years.

This dissertation work was born out of an initial pilot study to investigate 15 Scholars' motivations to teach in under-resourced school districts by examining their attitudes, experiences and understandings about teaching and students (Ganchorre & Tomanek, in press). Specifically, we asked: *Why do prospective STEM teachers choose to teach mathematics or science in high needs schools and districts?* We felt that understanding pre-service teachers' motivations could inform national efforts to recruit and retain STEM teachers into schools where the need for teachers is especially great. The pilot study was informed by the literature about pre-service and practicing teacher motivations to teach. Many of the studies on motivations to teach relied heavily on survey data and few qualitative studies were represented in the field. In my review of the literature, limited studies described prospective and practicing teachers' drivers to teach diverse student populations (Montecinos, 1994; Su, 1997). My understanding of important drivers that shape prospective teachers' career placement choices was limited in scope and depth in regards to hard-to-staff schools and districts. However, the pilot study revealed Scholars' dispositions of care and compassion towards students and families from under-resourced school districts as having a strong bearing on Scholars' career placement choice. Toward the end of the pilot study, I had delved into moral education, sociocultural and critical race theory. As I became aware of different theoretical frameworks I developed an appreciation for power and usefulness of one framework over another in order to draw interpretations. Thus, I began to develop a rich understanding of

this group of Scholars, and factors that shape an interest and commitment to teach in under-resourced schools.

The pilot study also revealed opportunities to ask further questions about this particular group of pre-service teachers that resulted in two additional papers (described below). Emerging assumptions or perceptions Scholars' held about their prospective future students became apparent through the pilot study. One question that spurred my interest was: *What beliefs and perceptions do prospective science and mathematics teachers hold about students and families from low income or poor households?* This study initially was informed by literature on prospective and practicing teachers' beliefs about students. Specifically, the literature documents a deficit perspective that prospective and practicing teachers have about students who come from low-income, poor, culturally, ethnically and linguistically diverse backgrounds. However, when trying to make sense of my findings I had a difficult time drawing conclusions that described Scholars' perceptions and that made coherent sense. I re-analyzed the data, and separated Scholars into different demographic groups, those who identified with being an ethnic or linguistic minority, those who identified with middle class or low-income schooling experiences, and different genders. I compared and contrasted Scholars' perceptions across these various groups and was still unable to draw interpretations that could explain shared beliefs across different groups.

I presented a poster on my third paper, regarding bridging identities of one Latino prospective science teacher at the 2010 National Association for Research in Science Teaching, in Philadelphia. During my poster session, a well-known researcher in equity issues related to STEM education discussed with me potential ways to analyze my

research findings. She introduced the idea of experiencing *social otherness,* in the context of describing the likelihood of White European middle-class pre-service teachers' ability to enact culturally relevant pedagogy during their student teaching. I came back to Tucson having thought about the idea of *social otherness* but put the idea aside as I didn't know yet how I would use the idea in my own work. It wasn't until months later, that I re-read through some of the data from Scholars' who had expressed unique life experiences that I began to recognize a pattern in Scholars' stated beliefs and their own experiences with *otherness.* It was then that I asked the second question: *How, if any, do these beliefs differ across participants' experiences with otherness?* This led to developing a completely new conceptual framework and re-analyzing my data with the new lens. The resulting paper titled, Otherness and Experience with Diverse Others as a Lens for Revealing Prospective Science and Math Teachers' Beliefs about Students and Families from Under-resourced School Districts, and it has been submitted to the journal *Equity and Excellence in Education* (Ganchorre & Tomanek, submitted).

The third paper in this dissertation evolved from my own understanding of what it was like for me growing up in a low-income household of immigrant parents and being an ethnic minority. In our first few meetings I quickly developed a strong rapport between “Andrew” and “Joseph” (pseudonyms), two Latino Noyce Scholars. Both Andrew and Joseph grew up low-income/poor. Their parents primarily spoke Spanish and immigrated to the United States. When we met, Andrew and Joseph often told me stories about their childhood experiences; they shared personal and sometimes difficult experiences that happened around schooling and family. In some cases it was their first time reflecting on their past schooling experiences and openly shared them with

someone. I related to, and found we shared similar schooling experiences. Often times the interview would finish and we would talk more about our life stories off record. It became apparent to me that Andrew and Joseph had strong self-images and the fact that they identified with the students they wanted to teach was related to their personal experiences. How they identified with and their belief of shared experiences with their future students appeared to influence their decision to teach in schools districts that enrolled a high proportion of low-income and poor students.

I became interested in Andrew's decision to student teach science in a bilingual middle school and subsequently his decision to take a teaching position at a bilingual poor urban school. I wanted to inspect how one Latino prospective science teacher's early life experiences shaped his commitment to teach in an under-resourced and bilingual school. To explore this idea further, I read theories on identity formation and the literature on Latino/Chicano pre-service and practicing teachers. I found Critical Latino theory along with Social Justice Theory to be most useful helping me formulate the research question: *What role identities shape a Latino prospective science teacher's commitment to teach science in a bilingual and under-resourced school?* To answer this question, I used Galindo's (1996) idea of bridging identities to make meaning of Andrew's early life experiences and his emerging professional role identity as teacher. The resulting paper titled, Social Capital Broker: A Latino Science Teacher's Emerging Professional Role Identity that Underlies a Commitment to Teach in a Bilingual Urban School, has been submitted to the journal *Cultural Studies in Science Education* (Ganchorre & Tomanek, submitted).

The culmination of the three papers made me consider what is at the core of this particular group of Noyce Scholars that underlies their commitment to teach in under-resourced schools and districts. Monetary support Scholars receive to participate in the program is one of several drivers to teach in hard-to-staff schools and districts. Scholars are given financial incentive to teach in hard-to-staff and under-resourced school districts; for each year of financial support pre-service teachers commit to two years of teaching. Most Scholars receive two years of support for a total of four-year teaching commitment. The majority of the Scholars are traditional students, meaning they attended college directly out of high school, with the exception of three Scholars. The commitment to teach for four years in a school district that is characterized as under-resourced is significant for relatively young Scholars. Financial incentive is in part one driver to teach but it cannot explain in totality Scholars' substantial commitment. This dissertation work in sum addresses the question: *What qualities are associated with Noyce Scholars' commitment to teach math and science in under-resourced schools and districts?* The chapters highlight Scholars' dispositions of care and compassion towards students who attend under-resourced schools; affirming perspectives and beliefs about students are influenced by Scholars' positive experience with otherness and diverse others; and how one pre-service science teacher's early role identities shape his emerging professional teacher role identity. Overall, this work describes my interpretation of these characteristics as attributes that may lead to a more critical reflection and understanding of the cultural, social and linguistic resources students and their families from low-income and poor backgrounds bring to Scholars' teaching practice.

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CHAPTER 2: COMMITMENT TO TEACH IN UNDER-RESOURCED SCHOOLS: PROSPECTIVE SCIENCE AND MATHEMATICS TEACHERS' DISPOSITIONS

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ABSTRACT

In this exploratory study we sought to gain an understanding of what motivates prospective teachers who are Noyce Scholars at a research-intensive southwestern U.S. university to commit to teaching secondary level science or mathematics in school districts that have a high proportion of students who come from low socioeconomic households. An interpretive methodology revealed three themes associated with Noyce Scholars' motivations to teach: (1) awareness of educational challenges, (2) sense of belonging to or comfort with diverse communities, and (3) belief that one can serve as a role model and resource. The paper describes and compares the significance of each theme among six prospective teachers, who identify with the schooling experiences of students who came from low income or poor households, and nine prospective teachers who identify with the schooling experiences in a middle income school or district. The implication of this study supports the importance of recruiting prospective science and mathematics teachers who have knowledge of and a disposition to work with learners from low income or poor households, even if those prospective teachers are not themselves members of under-served populations.

Key words: motivations, dispositions, pre-service teachers, low-socioeconomic status

INTRODUCTION

The supply of competent science and mathematics majors entering secondary teaching professions in the United States is not keeping pace with demand (National Science Teacher Association, 2000). The greatest need for highly trained teachers is in schools and districts with a large proportion of students from low income or poor families. These schools experience greater rates of teacher turnover among teachers who are most effective compared to less effective teachers, as measured by student performance on standardized tests (Boyd, Lankford, Loeb, & Wyckoff, 2005; Darling-Hammond & Sykes, 2003). Additionally, students eligible for free or reduced price lunches are 77 percent more likely to be taught by teachers teaching out of their major field of study (Ingersoll, 1999; 2002; 2010). Teacher quality, measured by level of preparation, certification, teaching experience and academic background is an indicator of student achievement (Darling-Hammond, 2010; Akiba, LeTendre, & Scribner, 2007). Students who come from low-income or poor households are taught by less effective and qualified teachers (Boyd et al., 2005; Esch, Chang-Ross, Guha, Humphrey, Shields, Tiffany-Morales, Wechsler, & Woodworth, 2005; Loeb, Darling-Hammond, & Luczak, 2005). These students experience inequitable learning opportunities and thus, inequitable achievement compared to their more affluent counterparts (Darling-Hammond, 2010; Irvine, 2004; Valenzuela, 1999). Students from low-income households are three times less likely to achieve proficiency levels in science and math than their more affluent counterparts (National Center for Educational Statistics, 2002). Given the growing population of low-income and poor students in the United States efforts, must be made to ensure equitable and just access to learning and academic achievement for these students.

As student demographics change, those who have chosen teaching careers can expect to teach students whose backgrounds and experiences are different from their own. For example, 86 percent of the teacher workforce in the United States is female who come from middle-class and White European backgrounds (Cochran-Smith, Davis & Fries, 2004), compared to 37 percent of school age children who come from low income or poor families (National Center for Educational Statistics, 2007). Schools with the highest level of poverty, measured by 75 percent of students eligible for free or reduce-price lunches are more likely to have higher proportions of Hispanic/Latino and Black students than any other ethnic or racial populations (National Center for Educational Statistics, 2006). Yet, only 20 percent of teachers who teach students from diverse cultural and linguistic backgrounds, and students with different abilities felt well prepared to meet the learning needs of these students irrespective of their teaching experience (National Center for Education Statistics, 1999).

Researchers and policy makers assert that teacher education must provide opportunities for teacher candidates to develop skills and knowledge to teach diverse students (Darling-Hammond, 2010; McAllister & Irvine, 2000; Moore, 2008a; 2008b; Parsons, E.C., Foster, S., Gomillion, C.T., & Simpson, J.S., 2008). Moore's and Parsons' work investigates different models to develop prospective science and mathematics teachers' knowledge about and respect towards diverse students. Moore (2008) implemented the use of a book club to develop prospective elementary teacher thinking about teachers' lives and teaching in diverse classrooms. In this club, prospective teachers reflect on complex issues about teaching in urban minority schools. Parsons and colleagues' (2008) investigation used role playing to elicit prospective science and

mathematics teachers' development of respect towards and understanding of African American urban high school students. Strategies for revealing and addressing prospective science teachers' understanding of diverse populations are particularly important, considering successful teachers of students from linguistically, socio-economically and culturally diverse backgrounds embody qualities of empathy and solidarity toward their students (Nieto, 2005). Teacher training opportunities to develop positive perspectives about students from diverse backgrounds can enhance prospective science and mathematics teachers' success in teaching students from a wide range of backgrounds and experiences.

In an effort to address the teacher shortage in science and mathematics disciplines in the US, the National Science Foundation (NSF) supports projects to increase the number of qualified and talented Science, Technology, Engineering and Mathematics (STEM) teachers in low-income and poor districts through the Robert Noyce Scholars program. The Noyce program is a nationwide program offered through various teacher training institutions in the US. At the institution where this study was conducted, the Noyce program provides forgivable loans for undergraduate science and mathematics majors who commit to teaching in districts that are under-resourced. Districts are under-resourced if they meet one of the following conditions: a high percentage of students in the district qualify for the free or reduced price lunch program, a high percentage of teachers are teaching out of their major field of studies, or the school district has experienced a high teacher attrition rate in the past three years. Given the seriousness of the problem described above, we became interested in understanding more about our Noyce Scholars' motivations to teach in districts that are under-resourced. We felt that

this understanding could inform national efforts to recruit and retain STEM teachers in schools where the need for teachers is especially great.

THEORETICAL FRAMEWORK

Motivation to teach has been well documented for entering and practicing teachers (Book & Freeman, 1986; Brookhart & Freeman, 1992; King, 1993; Jantzen, 1981; Ladson-Billings, 1997; 1995; Lortie, 1975; Montecinos, 1994; Phillips & Hatch, 2000; Serow, 1994; Shipp, 1999; Su, 1997; Wood, 1978; Young, 1995). Most of the research has been conducted using survey methods (Brookhart & Freeman, 1992; Jantzen, 1981). Results from these studies suggest that prospective and early career teachers' primary motivations to teach are the desire to work with children and the desire to help others (Wood, 1978; Young, 1995). Working with children is consistently the top selected survey item on surveys that ask teachers why they want to teach (Brookhart & Freeman, 1992; Jantzen, 1981). Recent studies continue to confirm that working with children is a main driver to teach (Serow, 1994; National Education Association, 2003; Phillip & Hatch, 2000; Young, 1995). Prospective teachers have an equally strong desire to help and serve children. Brookhart and Freeman (1992) reviewed 44 studies of entering teachers' beliefs and found that nurturing and caring for children was believed to be a teacher's most important role.

Other important reasons associated with prospective teachers' entrance to teaching are the desire to make a contribution to society and a sense of civic duty (Brookhart & Freeman, 1992; National Education Association, 2003; Su, 1997; Young, 1995). African

American students considering careers in teaching are motivated by the belief that teaching contributes to the betterment of society (King, 1993; Shipp, 1999). Culturally diverse prospective teachers express a heightened awareness of educational inequities and social injustices among underserved populations (Guyton et al., 1996; King, 1993; Montecinos, 1994; Sleeter, 2000; Su, 1997). These prospective teachers identify themselves as agents of social change, committed to teaching students from socio-culturally diverse backgrounds (Sleeter, 2000; 2001; Su, 1997).

In a study by Su (1997), prospective White teachers identified teaching as a way to bring about social change as a driver for entering teaching. However, prospective White teachers did not articulate an awareness of or concern for the disparate educational conditions among poor and culturally diverse students. Teachers' abilities to acquire and develop knowledge about their students are important components of teaching well (Cochran-Smith et al., 2004; Darling-Hammond & Bransford, 2005; Villegas & Lucas, 2002). Research on preparing teachers to teach diverse learners demonstrated that academic achievement among culturally and linguistically diverse students increased when teachers used knowledge about their students' lives to connect to subject material in meaningful ways (Au, 2002; Garcia, 1993).

Several other factors were also drivers to enter teaching. Among 41 African American prospective teachers, a significant percent were motivated by their belief that their abilities were well matched to teaching (King, 1993). For African American prospective teachers, teaching provides opportunities for creative freedom, a benefit perceived as outweighing other careers associated with high salary or prestige (King, 1993). Motivations also differ between primary and secondary level teachers. While

working with children is more important for primary teachers, interest in subject area is a more motivating factor for secondary teachers (Book & Freeman, 1986).

THE STUDY RATIONALE AND RESEARCH QUESTION

Prospective teachers' motivation to teach has been documented in the literature, but little is known about prospective secondary level STEM teachers' motivations in particular. Why do prospective STEM teachers choose to teach mathematics or science in high needs schools and districts? This exploratory study was designed to answer this question. Specifically, we sought to characterize Noyce-supported prospective teachers' motivations to teach by examining their attitudes, experiences and understandings about teaching and students. The study took place at a land grant Research I university in the Southwest between December 2006 and March 2008. The interpretive nature of the study revealed a rich description of participants' motivations to teach that enriches the survey findings documented in the literature (Brookhart & Freeman, 1992; Jantzen, 1981).

Study Participants

Study participants were all recipients of the Noyce Scholars awards at the university. The Noyce Scholars Program recruits undergraduate students from the university's College of Science. The students enroll in a College of Science-based teacher preparation program to pursue teacher certification in secondary mathematics or science. The teacher preparation program works closely with two school districts. These districts have high percentages of students who are eligible for free or reduced lunch prices, one of the criteria for inclusion as an eligible high need school district in the

Noyce Scholars program. For example, 84% of the students enrolled in one of the two partner districts are eligible for free or reduced lunch prices through a government program for poor or low income families. Many prospective teachers in the teacher preparation programs are placed in these two districts to complete their classroom observations and their student teaching experiences. A number of these prospective teachers are ultimately hired at the partner school districts which we shall refer to throughout the remainder of the paper as under-resourced schools and districts.

Students are selected to become Noyce Scholars through a competitive process. In turn for each year of financial support, in the form of a forgivable-loan, Noyce Scholars commit to teach in an under-resourced school district for two years. A student can receive up to two years of this financial support during the final two years of their teacher preparation program leading to teacher certification. At this university, Noyce Scholars are required to have a grade-point average of at least a 2.5 on a 4.0 scale with a 4.0 distinguishing a mark of excellence. The average grade-point average of the study participants at the end of the study was 3.33 (between A and B in a letter-grade system). Throughout the remainder of this paper we refer to the Noyce Scholars who participated in this study as Scholars.

Su (1997) compared ethnically diverse prospective teachers' interests to teach with prospective teachers from White European backgrounds. These two groups articulated different drivers to teach. Specifically, prospective teachers from diverse backgrounds were motivated by an interest to address social injustices in formal schooling. Similar to Su's method, the current study considered comparing drivers to teach among teachers from ethnically diverse and White European backgrounds. Twelve

of the 15 Scholars, were from White European backgrounds, a comparison study based on ethnic background would disproportionately represent one group over another. However, grouping all Scholars into one group masked nuanced understandings of students and families from under-served school districts. In an attempt to make visible nuances within the same theme among Scholars' interests to teach, Scholars were grouped based on their own prior schooling experiences. There were eleven female and four male Scholars in the study who were divided into two groups: (1) those who identified with schooling experiences in a low-income, under-served school, and (2) those who identified with experiences in middle- to upper income and well served schools. Six of the Scholars identified with schooling experiences in a low income school or district, while nine Scholars identified with schooling experiences of in middle to high income school or district (see Table 1). All names are pseudonyms.

Scholars identifying with schooling experience in a low-income school came from various ethnic backgrounds. Andrew and Joseph are Mexican Americans, from homes where the primary spoken language was Spanish. Samanthi is of East Indian decent and her primary home language was the same. Matt, Paul and Tanya are from White European backgrounds. All scholars who identified with schooling experiences in a middle-upper income school are from White European backgrounds. Of the fifteen Scholars, six majored in mathematics, two in chemistry, one in earth sciences, four in biology, and one in physics. One Scholar had transferred from the partner community college and was a non-traditional student returning back to school after years in the workforce. The remaining fourteen Scholars had been enrolled at the university after high

school. Three Scholars had graduated and were currently teaching in under-resourced schools.

Data Collection and Analysis

Data collected for this study included Scholars' written responses to a questionnaire administered during Noyce Scholars' first semester (November 2006), transcript from a semi-structured interview based on responses to the questionnaire, the Scholars program application including a personal statement about teaching, and transcripts and observers' notes from two focus group discussions. Interviews were used to further explore Scholars' attitudes, experiences and understandings that arose from the questionnaire. To triangulate data, interview and focus group discussions were used as an alternative method to reveal the Scholars' attitudes and understandings as indications of their interest to teach in under-resourced school districts and schools. Interviews were conducted by the first author with each Scholar prior to the start of his/her second semester of participation (Fall of 2006 and 2007) in the Noyce Scholars program. Focus group discussions were conducted by the second author during spring 2007 and 2008 with four and eleven scholars respectively. Focus group discussants included Scholars who were at various stages of their teacher preparation training or in the early part of the first year of their teaching careers. Beliefs are complex and stable systems, significant changes in beliefs are less likely to happen from one term to another (Haberman, 1996). Data collected during various stages of Scholars' training were scanned for shifts in beliefs within the two groups. No significant changes in beliefs were observed over time. Observation notes during both focus group discussions were taken by the first author.

Interviews and the focus group discussions were audio recorded. Observers' notes were taken by the first author at both focus group discussions.

Questionnaire responses, interviews, personal statements and focus group transcripts were analyzed using an interpretive coding method (Marshall & Rossman, 2006; Maxell, 2005). Using the research question to guide analysis, these data sources were analyzed and reanalyzed to identify students' attitudes, experiences and understandings that indicated motivation to teach mathematics or science in low income school districts. Starting with one interview transcript, the authors independently made an initial pass at identifying emerging excerpts that related to the research question and assigned a descriptive code to the excerpts (Miles & Huberman, 1984; Marshall & Rossman, 2006; Maxell, 2005). Descriptive codes were compared and discussed until a set of common codes were agreed upon.

Each author then independently coded the remaining interviews and compared each other's coding assignments to confirm consistency and inter-coder reliability (Miles & Huberman, 1984; Creswell, 2005). New emerging codes were analyzed for appropriateness. Codes were either added or discarded depending on the codes' relevance to answering the research question. The questionnaire and focus group transcripts were coded using the same descriptive coding scheme. The descriptive codes were organized into a matrix, with the descriptive codes listed in the first column, second column was a detailed description. Listed along the top first row were Scholars' pseudonyms. The number of times a descriptive code appeared among Scholars was noted. Codes that appeared prevalent were grouped according to similar thematic categories. Codes that did not appear prevalent were dropped from analysis. Thematic categories were translated

into interpretive codes that described the significance of the grouping. Consensus was reached by the two authors on the final interpretive codes which were collapsed once more into three general themes: (1) a*wareness of educational challenges,* (2) s*ense of belonging or comfort with diverse communities, and (3) a belief that one can serve as a role model and resource.*

FINDINGS

Theme 1: Awareness of Educational Challenges

All Scholars were motivated by their experiences with or awareness of the educational challenges encountered by students who attend schools in under-resourced districts. Challenges that Scholars were most aware of were related to familial responsibilities such as working to help with the family finances, taking care of siblings, or translating and interpreting English for family members. Scholars also believed that students who attend school in under-resourced school districts have limited access to human resources and struggle because they do not have the necessary bilingual language support in their classes. Scholars also recognized issues related to economic instability such as residential and food security and family mobility, as challenges faced by students from low-income backgrounds.

Scholars identifying with the experiences of students in low income schools

Some Scholars were motivated to teach in these schools because of their experiences as students attending similar schools or their awareness of the complex set of

circumstances that challenge the learning opportunities for such students. Scholars who attended schools that were under-resourced, who themselves experienced obstacles during their early schooling, believed that they understand the educational challenges experienced by the students they have committed to teach. In particular, Scholars recognized the challenges students face to fulfill their familial obligations and responsibilities, lack of quality teachers and higher level courses, and familial mobility. Below, Andrew discusses what he believes to be some of the familial responsibilities of a child who is from a low income immigrant family. In response to a scenario in the questionnaire (see scenario in Appendix A), another participant, Joseph, talks about why a student may not have the opportunity to take advantage of after school programming or tutoring services, as he reflects on his own responsibility as an older sibling who had to care for his younger sister.

> *Whereas if you're in an area where your parents are struggling to pay bills, your parents don't speak English, you have other worries. You maybe have to sell candy at school to help out as much as you can. You have to go places to translate for your parents. You have to make decisions that adults make so there's other things going through your head besides, you know, just learning what's in school and what I'm going to do after school. (Andrew, focus group)*

> *I don't think I ever got the opportunity in high school [to stay after school for help], maybe come in at lunch, definitely not after school…I wasn't*

even sure how I would get home, because my Mom wouldn't probably come pick me up…I'd have to go home anyways and take care of my sister. So, definitely not, I don't think I ever stayed after school [for help]. (Joseph, interview)

As school age children, some Scholars were burdened with responsibilities and obligations that people normally do not experience until adulthood. These Scholars contributed to and supported their families by working or by taking care of younger siblings after school while their parents worked. At times, family responsibilities limited Scholars' opportunities to learn. As children, they had family obligations that prevented them from seeking help after school. Others had the difficult job of making meaning, interpreting and translating complex issues and situations for their parents. Scholars had to be their own translators of English and Spanish but also had to develop understanding to be able to move between culturally different spaces. Furthermore, they negotiated an adult world that impacted their ability to participate fully in their education and future learning. In an interview, Andrew discussed how he had to be the mediator between his parents and school administrators while at the same time advocate for himself to be able to take mainstream courses rather than be put into English as a second language courses. Other Scholars, who identified with the schooling experiences in a low income school, but who may not have had familial responsibilities similar to Andrew or Joseph, were still able to identify potential familial issues that may impact a student's performance in school. Samanthi's reaction to the scenario in Appendix A describes the pull a child may experience when having to choose between school work and family responsibilities.

> *If there are additional responsibilities that the student has outside of class, then they may have to take care of those needs first. It might not be that he thinks that homework is not important at all; however, if the student is more worried about supporting his family or taking care of siblings, then that will obviously take priority over homework. (Samanthi, questionnaire)*

Scholars experienced further challenges to learning opportunities due to lack of school resources. This was particularly evident in their experiences in secondary schooling in mathematics classes. Below, Matt recalls his school's need for math teachers and the continued need for full time teachers in schools today.

> *My [my second] year [in high school] my math teacher left halfway through the year and then we got a part time sub for half a year and the next year they fired a guy halfway through the year. There is just always a need for a math teacher. (Matt, interview)*

Scholars discussed specific examples of challenges associated with in-school experiences that impacted opportunities to further their learning. Below, Tanya describes her experiences as they relate to a scenario on the questionnaire about a girl who has just moved to a new school in the middle of the academic year (see Appendix B). Tanya experienced moving a number of times during her primary and secondary schooling, at

times moving a few times within the same academic year. She identifies a number of difficulties associated with moving that influenced her ability to do well in class.

> *As we already discussed, I moved, and this particular scenario involved a girl moving. So even subjects I felt competent in, I can remember times when I wasn't doing well in a particular class that had nothing to do with my abilities; it had more to do with we changed halfway through the year and this isn't exactly what I have been studying. And with friends, and not having friends, and cultural issues, whether I had a funny accent where I was living, I can just really feel for this girl. (Tanya, interview)*

Scholars identifying with the experiences of students in middle to high income schools.

Scholars who, because of their own educational experiences, identified with the experiences of middle to high income schools, cited challenges related to students' parental involvement, English language learner status, and residential and food security. Although Scholars may not have had direct experiences with students and families from low-income backgrounds, they were able to imagine some of the circumstances that may impact students' and their parents' schooling. In an attempt to explain reasons why a potential student may not be turning in his assignment, Suzanne considered a student's family obligation to work to support his family. Suzanne's evaluation of the level of parents' support in a scenario on a questionnaire (see Appendix A), was that they were too busy working and could not attend a parent–teacher conference.

> *The student might have to work in order to help support his family. If the parents do not come to parent-teacher conferences, they might also be busy working. (Suzanne, questionnaire)*

Other Scholars who did not grow up in low income communities described how they were exposed to situations where they became aware of the hardships of students who come from low-income backgrounds or who are English language learners. For example, some Scholars had opportunities to work with diverse students through volunteering and teaching internships. Lana was placed in a low-income school district during their teaching internship. Dana volunteered at a grade school with a high proportion of students from low-income and diverse cultural and linguistic backgrounds. Tami tutored her high school peers and taught swimming lessons to young people from different backgrounds and experiences. The opportunity to work and gain positive experiences with young people from diverse backgrounds helped Scholars connect students' life experiences with their academic performance.

During Lana's internship in an under-resourced school, she developed awareness for the lives of students she will potentially teach. In an interview, Lana described her experience growing up in a small rural town as "very much Pleasantville," a middle class European American experience. She recognized that this is not the reality of many of the students she will teach and who she came to know during her internship. Her positive disposition toward young people allowed Lana to develop rapport with the students in a short period of time. This rapport and trust led way to students sharing their stories with

Lana. During her internship experience, Lana was able to develop an appreciation of the pressing issues students and families face, who live under economic instability or who come from backgrounds where English is not their primary language.

> *Just seeing my students, like their parents, working a lot or struggling with language barriers, I just never even [had to] deal with [growing up]. So just thinking about, I don't know, some of my students, one girl ran away, a couple of them have been moving or, like, the parents have been moving in and out of districts to try to get them interested in school…I mean it's just been kinda crazy to hear their stories and what their lives outside of school [are like]. (Lana, interview)*

Responding to the scenario in Appendix A, Dana and Tami considered different reasons why students from under-resourced schools may have challenges. Dana considered that out of school experiences that may influence a student's performance. She discusses the reality of students who might be homeless. Students may not have a safe place to sleep and have food to eat. Concerns about securing food and shelter outweigh a student's need to secure proper school supplies to do school work. Tami articulates in detail how English language proficiency effect a student's learning in and out of school. Tami identifies the gap between instruction for mainstream students and bilingual students that leads to difficulty for a bilingual student to complete assignments. She also recognizes how a bilingual student's proficiency in conversational English may mask proficiency in reading and comprehending English that causes a student to fall

behind in class. The situation can be further exacerbated by a student's discomfort to ask his/her teacher questions.

> *Plenty of things could be going on when that student steps outside of the [school] door…Perhaps he is homeless and more concerned with eating and safely sleeping than finding a pencil and paper for homework assignments. I would certainly be having a meeting with this student right away if I could not get hold of his parents. (Dana, questionnaire)*

> *A second factor that could be affecting the student's performance is he is an English Language Learner. Just because he is able to effectively communicate with his peers during a class discussion doesn't mean that he has complete control of the English language. He may have a lot of difficulty writing and reading directions in English, which is why he doesn't turn in assignments. He might understand pieces that the teacher went over in class, but since the teacher probably only goes over a small portion of the material, the student is probably confused for the rest of the assignment and may be too afraid to ask for additional help. (Tami, questionnaire)*

Scholars who did not come from low socioeconomic status families or communities had an awareness of the contexts in which high needs students must learn and how those contexts can hinder students' abilities to realize their academic potential.

Critical to developing Scholars' awareness of these contexts were opportunities to spend extended periods of time with students whose backgrounds and experiences were different from their own. Such experiences exposed Scholars to the realities of students' lives. Scholars' appreciation for the circumstances in which students from low income households and under-resourced schools live motivates them to want to teach students who have limited resources. Many Scholars had an understanding of the extensive circumstances that complicate the lives of their future students. Those who had experienced personal challenges to learning opportunities were motivated to teach students in low income school districts because of their personal experiences with these challenges.

Theme 2: Sense of Belonging or Comfort With Diverse Communities

Scholars believe under-resourced school districts are culturally, linguistically and socioeconomically diverse. They are motivated to teach in these districts because they have a sense of belonging to similar communities and feel comfortable with students and families from diverse backgrounds and communities. This sense of belonging stems from Scholars' beliefs that they share similar life experiences and histories with their future students and families. Scholars feel they are deeply connected to students from under-resourced school districts in ways they feel they could not connect with students or families from more affluent school districts. To have knowledge about their future students based on shared lived experiences gives prospective teachers a sense of comfort and a belief that teaching in communities similar to those they grew up in is a good fit. Scholars believe that as teachers they are highly regarded by families who live in under-

resourced schools districts compared to families in affluent school districts, mainly because parents and students from Hispanic backgrounds practice more respect toward teachers than do parents and students from affluent backgrounds. Familiarity with the cultural practices of Hispanic families enables scholars to connect students' lives with the classroom in meaningful ways. However, a sense of belonging or comfort with diverse communities was not a prevalent theme among Scholars who identified with schooling experiences in middle-upper income schools with one exception. The exception was Madeline who grew up in a low-income community but attended private school until she was in her third year of high school.

Scholars identifying with experiences of students in low income schools.

Scholars who had spent time in, attended schools in, or grown up in communities classified as low income communicated a sense of belonging to or being part of their community. In the southwestern state where the study took place, low socioeconomic status communities are characterized by a high proportion of ethnic minority families whose primary language is not English. Scholars were at ease and familiar with these communities. They had a sense of comfort teaching in school districts that have a large population of students and families that are culturally and linguistically different than those in a majority White middle class affluent school district. In several instances Scholars expressed a desire to return to a community that they had a sense of comfort with.

On a questionnaire, Joseph identified with the experiences of high need students as his top reason for wanting to teach in an under-resourced school. He further described

this sentiment in an interview (see excerpt from his interview below). For Joseph, this sense of familiarity was a strong driver to return to teach in a community with a high proportion of students who come from low income backgrounds. Furthermore, he noted that his experiences were part of who he is, an identity that he could not ignore. For this reason, Joseph was compelled to return to teach in a school with students that he perceived as having similar shared experiences.

> *I identify with the experiences of high needs students and I think…that had to be number one [reason to teach] because I've had eighteen years of that. It's a huge part of my life and it's just something that is always there. I can't really ignore [it]. I think that's definitely the number one reason why I want to teach at a high needs school." (Joseph, interview)*

Similarly, Paul grew up and lived in a community that is much like the community in which he has chosen to teach. Below, Paul discusses how he knew no other kind of community. The community he grew up in was similar to one that he chose to teach in. As a student teacher he requested to teach in the community in which he lives, a rural border town with a high proportion of Spanish-speaking families and students who come from low income backgrounds. Paul planned to continue teaching in the same school after he completes his student teaching. In the excerpt below he discusses with pride the fact that he teaches in the community he's lived in for some time.

…it seems real foreign to me when people start talking about working with high needs, cultural diversity and stuff like that because that's where I've always been. You know, I was in this district before the high schools here. And then where I graduated from high school was in a small town which was the same thing, the same exact thing. And so yeah, that's what I'm comfortable with and that's what I've always known...(Paul, interview)

Halfway through Paul's student teaching his mentor teacher resigned, leaving Paul to teach full high school math time. Paul inherited classes with the majority of his students performing below average and many not passing. For an inexperienced student-teacher, this may have been a daunting task. However, Paul's confidence in his abilities as a teacher and his comfort with his students served as a strong foundation from which he taught. Paul did not accept his students' performance as the status quo. Rather, his sense of belonging to the community, thus a commitment to his students, enabled Paul to push and challenge his students to engage in math. Paul worked with his students in deliberate and meaningful ways. By the end of the school year his students' performance was above average. Below Paul demonstrates how he used his knowledge about students to connect their lives in meaningful ways in the classroom.

Today, I wanted to give them an example of how you don't learn by watching, you learn by doing,' cause half the students weren't trying the example. They're just waiting for the answer…So I thought about it and for second period I thought about tortillas, everybody watches their Mom

make tortillas and they come out nice. Then I drew this very unique shape on the board and said, "The first tortilla you made looked like that, didn't it? You watched your Mom forever and it looked easy but when you tried it, you didn't have a clue what you were doing and it looked like this." They all laughed and said it was true. And I told them [math] is the same way. (Paul, interview after a lesson observation)

Scholars identifying with experiences of students in middle to high income schools.

Of the nine Scholars who identified with the experiences in a middle to high income school, only Madeline expressed a sense of comfort and belonging to a community with a high proportion of students and families that come from low income backgrounds. Madeline grew up in an urban community on the south side of a large city. The school district where Madeline lived is considered to be under-resourced. Although many of her extended family members went to school in the district, Madeline did not. She attended a private school from primary school until she was in her third year of high school. During her interview, Madeline described her interest in teaching in an under-resourced community and school because of her comfort and sense of belonging to the community.

I grew up on the south side of town. I feel really comfortable in that area... I've worked at [a grocery store] at the south side and I just, I'm real comfortable there…(Madeline, interview)

For Scholars who identified with the experiences of low income schooling, a sense of familiarity and comfort with the community of students with whom they share life experiences was an important driver to teach in an under-resourced school. Although Madeline did not attend an under-resourced school or experience the educational challenges of participants who identified with experiences of low-income schooling, Madeline grew up in an under-resourced community. Her sense of belonging stemmed from her experiences growing up and working in the neighborhood. She continued to feel connected to the community, which led to her interest in teaching in under-resourced schools.

Theme 3: A Belief That One Can Serve as a Role Model and Resource

This theme was strongly supported in our data and is consistent with the literature on prospective teachers' desire to teach. In a review of the literature on prospective teachers' motivations, Brookhart and Freeman (1992) found that helping and serving children were believed by prospective teachers to be the most important roles they will have as teachers. Twelve out of the fifteen Scholars selected *to be able to serve as a role model or help students* as one of their top two choices on the questionnaire regarding important factors in their desire to teach students in under-resourced schools and districts. All Scholars cared about students and wanted to support those students, especially if perceived to be under-served. Many Scholars had a perception that students who attend schools in low income districts can benefit from having access to adults who can serve as role models. Scholars desire to work in a school district where they believe they can positively impact a student's life is a source of great satisfaction and fulfillment.

Scholars care about young people and believe as teachers, they can contribute in meaningful ways to their students' future well-being.

Scholars identifying with experiences of students in low income schools.

Below are representative statements by Scholars who identified with experiences in low income schools and who had a strong desire to serve as role models. Samanthi describes her reason for wanting to serve as a role model and help students who she believes can benefit most from a supportive other. She drew from her experience talking with high school students during her internship at an under-resourced school.

> *They ask me if I go to parties and stuff like that. I'm not going to tell them I go to parties, you know. I'm just portraying that positive role model and I feel like it makes a difference because when they come to that situation, " What should I do?" they might think of people they look up to. I'm hoping I could be more of that role model, not even in a teacher sense, just like a person or an adult in their life if they don't have that at home. (Samanthi, interview)*

As mentioned earlier, Paul's mentor teacher resigned during the semester he was student teaching, at which point Paul inherited his mentor teacher's classes. Paul stepped into the role of teacher with ease. His work ethic and desire to teach under-resourced students were evident in his ideas about serving as a role model. Paul believed that being a role model is one of the most important roles a teacher plays. The way Paul carried

himself, by following through with his responsibilities as a teacher, is the single most important way he can be a positive role model to his students. He discussed how coming to school prepared him to teach and work with his students is a way he can best serve students. Paul also believed that developing positive relationships was a way to develop community and that it modeled positive behaviors that are important for students to learn. Below is an excerpt where Paul describes his commitment to teaching and his students.

> *I think that is the most important [reason to teach]. The best way I can be a role model is to show them I'm doing what I'm supposed to do. So I show up prepared every day and I teach every day. They learn every day and we work. That is a huge thing for them, because a lot of them say, "I don't feel like working today Mr." ...Another way is just get to know people, building relationships, but the biggest is how I conduct myself. (Paul, interview)*

Andrew also believed that part of teaching is developing relationships with students. To be able to be a part of a students' life is an important aspect of teaching. Andrew was driven to teach because he believed that as a teacher he is able to positively influence a student's life and to the school community. He recognized that there is a great need to fill science and math teacher positions in under-resourced schools. This reality became obvious to Andrew while he tutored math and science at an under-resourced bilingual middle school. Below Andrew explains his awareness of the need for science and math teachers in schools with a high proportion of students who come from low-

income backgrounds. Andrew will seek a teaching position at an under-resourced school to address the need for schools to fill science teacher positions.

> *I guess [I want to] be a part of someone's life and feel like [I'm] actually making a difference. But then also, when you look at [a] school, they don't have an actual teacher in place for math or science; it's just a sub. So it's just that sometimes you see, wow, there are really schools that really need teachers. I just kinda hope that I can, I guess, help out in that way. (Andrew, interview)*

Scholars identifying with experiences of students in middle to high income schools.

Serving as a positive role model for students in under-resourced schools was an equally important driver for Scholars who came from middle to high income school experiences. Maggie volunteered extensively in under-resourced communities and with children. For example, she took an alternative winter break in a large urban city to work with the homeless. Her commitment to service extended to her desire to teach in under-served communities. Below she describes her sincere interest in serving as a positive adult in the lives of under-served students.

> *...I think that high need schools, kids in those schools might not have always have the most positive role models, and so if I can be something to a kid that they might not even have, that's definitely like changing the*

world for that one person and giving them possibility that they may have never thought of. (Maggie, interview)

Scholars believed that students who attend schools that are located in low income communities may not have networks of support and resources that are as well established as networks available to students who live and attend school in more affluent districts. Scholars recognized the inequitable distribution of resources among families of students from low and middle to high income backgrounds. Teaching STEM disciplines to students in high need schools was a way in which Scholars believed they could help balance the educational disparities. They believed that by teaching in low income districts they could contribute in a small way to addressing the disparities in resources between under-served and well-served school districts.

Scholars believed that schools in low income neighborhoods did not benefit from the same level of revenue generated based on property values. As a consequence, Scholars' perceived students in low income neighborhoods as having limited access to material and human resources. They viewed teaching in such schools as one way to rebalance the resource scales. Below, Madeline explains why she has chosen to teach in an under-resourced school, while Suzanne has already identified a school that is in need of science teachers, in which she would like to teach after she completes her undergraduate degree. Teaching in schools where students do not have material resources or permanent science or math teachers was a way in which Scholars felt they could make a contribution, thereby giving them a sense of fulfillment.

And I really like to work with students that don't have the best, um, supplies, and, you know, are not in the best areas and don't have the best funding in their schools, because I think they're the ones that are forgotten the most. (Madeline, interview)

I would like to teach in XXXXX after I graduate because I understand that the need for science teachers is great. I would like to teach where I will be needed... (Suzanne, personal statement)

Scholars believed that they could enhance students' future lives and better their life prospects by helping them learn, particularly in the STEM disciplines. Several of the participants believe that being knowledgeable in math and science was important if a student was to lead a healthy and successful life. Scholars believed they were able to teach math and science for deep understanding and that students would be able to apply STEM knowledge in ways that could improve their future lives. Additionally, Scholars believed that they could develop students' facilities in critical thinking and analytical skills, which would lead to future opportunities that these students would not otherwise have.

I really think that you're teaching skills, and… trying to give them skills so they can become a productive adult, so they have opportunities that they may not have without them. (Madeline, interview)

Many Scholars expressed caring for and an interest in students' lives and their success. Karen speaks about the relationship of caring she developed for science students she taught during her internship experience in a high-need school. Elaine speaks about the kind of perspectives a teacher should hold of students who come from low income backgrounds. Maggie explains supporting and caring for students and their lives can help support their desire to learn.

> *I really wanted them to all do well because I really cared for each one of them. (Karen, interview)*

> *I think also… being [a] quality teacher is being…not optimistic, but hopeful, maybe, and not judgmental. Not just writing them off and, "Oh well they're not good students anyways", or "There's no way they can achieve because they're at a high needs school [and] from a poor background." (Elaine, interview)*

> *There are so many things going on in a teenager's life besides just "All right, what's a combustion reaction?" That's like the last thing they can possibly be thinking about and so, I mean, if you can be there to support them in the rest of their lives, they're more likely to pay a little more attention to this cool reaction. (Maggie, interview)*

DISCUSSION

This study sought to understand why Noyce Scholars choose to teach in under-resourced schools. Under-resourced schools often enroll a high proportion of students who come from low-income households. In the Southwest, where this study took place, many of these students grow up in households where the primary language spoken at home is not English and whose families' cultural practices are different from those practiced at school. It is especially important for teachers who come from backgrounds and experiences that differ from their students' to have affirming attitudes and dispositions of care towards students to effectively meet their students' learning needs (Darling-Hammond, 2010; Noddings, 1992; Wentzl, 1997), to be able to empathize with another such that another's interests and reality are centrally positioned to serve as the point of importance. By removing one's own realities from the center of importance, one can view others with compassion and care about their situations (Noddings, 1984). The Scholars in this study articulated a sense of compassion for their future students and families' life challenges and complex circumstances. A disposition of compassion enabled participants to view their future students and their families with deeper understanding and empathy. Some Scholars' compassion towards students came from their sense of connectedness to students who share their cultural, social, or personal histories. Other Scholars who may not have had similar backgrounds and autobiographies also expressed deep understanding and care for students who attend under-resourced schools. Scholars have caring perspectives toward children and have a vested interest in their future well-being.

Compassion for others is consistently identified in the literature as a quality of highly effective teachers of diverse students (Nieto, 2005). Scholars' compassion for their future students is grounded in their familiarity, whether lived or acquired, of their potential students' and families' life struggles. Because some Noyce Scholars had similar life experiences and histories, they understand intimately the difficulties that children from diverse backgrounds face. Andrew discussed that school work may not be a primary importance for a student because a student may have to serve in different capacities and roles to support their families. In Joseph's case he could not stay after school to receive additional help with schooling because he had to care for his siblings while his mother worked. Some Scholars, are people who themselves overcame difficulties during their own schooling experiences. In spite of the difficult circumstances Scholars faced as school age children, they successfully navigated their primary and secondary schooling. Their perspectives as students who have successfully negotiated their early years of schooling provides Scholars insights to the resilient qualities of students who are from low-income or culturally and linguistically diverse backgrounds.

Affirming attitudes and a developed knowledge about their students are important components of teaching well (Cochran-Smith et al., 2004; Darling-Hammond & Bransford, 2005; Villegas & Lucas, 2002). Scholars' pursued deeper understanding of students' and their families' in order to create meaningful interactions in the class. This was evident during Paul's student teaching experience. Paul, who identifies with the schooling experiences of low-income and diverse students, described trying to connect the practice of math with his students' home lives. After some serious thought between class periods, Paul came up with an analogy of students watching their mothers making

tortillas (Mexican flat bread) for his next class. Although students knew how tortillas are made from watching their mothers, students could not make a tortilla as well as their mothers. Students needed to practice to become good at making tortillas, just as they needed to practice doing math to become good at it. This analogy, which drew on students' lived experience, resonated with Paul's students. Paul's disposition of compassion and understanding of his students drove him to search for ways to make meaningful connections between his students' lives and school. His sense of compassion for his students strengthens his commitment to teach students from under-resourced schools and districts.

However, Scholars which may not come from similar backgrounds and experiences as their future students also have dispositions that enable them to view students from a humanistic and caring perspective. For example, Tami, a Scholar who identifies with the experiences of middle-class schooling, articulated a complex understanding of how English language learning status impacts a student's learning opportunities. Tami is able to consider a situation from the perspective of a student whose primary language is not English. To place herself in the position of an English language learner is an exercise in empathy, particularly because Tami is monolingual and had not experienced personally the difficulties of living in a society as a second language learner.

Scholars' choice to work in under-served communities fulfills a civic need to contribute to a more just society (Su, 1997). Scholars' need to contribute to society is a stance from which Scholars are able to empathize and understand the complex issues and situations that others, in particular students who come from low income and linguistically diverse backgrounds encounter. Scholars in this study who did not share life experiences

with their future students nonetheless seek ways to understand the complex life circumstances in which students and families persist and live. Compassion toward students who have experienced difficult life challenges and a desire to understand students and their families' life circumstances connect Scholars to a community that they feel they belong to or have a sense of comfort with. A compassionate disposition toward students and their families' life experiences and situations is a foundation from which Scholars can build meaningful student-teacher relationships.

Scholars in this study confirm that working with children is a main driver to teach (Serow, 1994; National Education Association, 2003; Phillip & Hatch 2000; Young 1995). Prospective teachers are equally motivated to serve and play a significant role in children's lives (Brookhart and Freeman, 1992). Scholars view opportunities to mentor students as ways to positively impact students' personal and academic lives. They are confident in their ability to cultivate positive relationships with students who come from low income backgrounds even if they themselves do not come from similar experiences. Scholars believe they have knowledge and experiences that can assist students to realize alternative life opportunities and choices.

Though Scholars have dispositions of care and compassion for students from low-income households and backgrounds, how might Scholars' perceptions, attitudes, and understandings underlie their dispositions? Scholars all had a belief that they are able to cultivate relationships with students of diverse backgrounds regardless of their own experiences. Therefore it is reasonable to explore in future studies, how Scholars' experiences frame their understanding and knowledge of students and their families who live in low-income school districts. The multicultural literature advocates for further

understanding about prospective teachers' perceptions, attitudes, and understandings towards diversity (Bryan & Atwater, 2002; Darling-Hammond, 2010; Moore, 2009; Parsons et. al. 2008). Another issue raised by this study is that teacher candidates who come from White middle-class express awareness of equity issues in education but it isn't clear to what depth they are able to draw on this knowledge in their practice. Diverse as well as White middle-class prospective teachers both need support and pedagogical training (Montecinos, 1994; Su, 1997; Sleeter, 2001). Understanding Scholars' dispositions of care and compassion can be starting points to assist teacher educators to promote Scholars' success working with diverse students regardless of Scholars' backgrounds and experiences.

IMPLICATIONS

An implication of this study for science teacher education is to use Scholars' knowledge and experiences as a resource to train future teacher candidates' understanding about students from low-income households. A program that builds upon Scholars' dispositions of care and compassion can create extended opportunities for Scholars to work under guidance and mentorship with under-resourced students in different contexts with the purpose to develop Scholars' range of knowledge of the social, linguistic and cultural capital students bring to school (Gonzales et. al., 2005). Such contexts to engage with students and families could include: extended time in the classroom, after school tutoring, extra-curricular activities, and community and home visits during Scholars' teacher training. Furthermore, an overlooked resource of

knowledge from which Scholars can draw further understandings of their future students are Scholar colleagues, who share similar backgrounds and experiences with their future students. Diverse prospective teachers, represent an untapped source of knowledge that can inform how teacher educators can train prospective teachers (Delpit, 1995). Diverse Scholars along with practicing teacher Scholars can provide firsthand knowledge about the lives and issues relevant to under-resourced students. Authentic experiences associated with teaching students from under-resourced backgrounds can be used to provide prospective teacher Scholars a perspective that informs their thinking in the learning environment.

The literature documents a lack of knowledge teachers have about urban students' experiences and lives that impact teachers' abilities to meet the learning needs of their students (Irvine, 2003). When teachers seek to know their students and incorporate this knowledge in meaningful ways into the curriculum, students demonstrate learning gains (Au, 2002; Garcia, 1992). Our study revealed that prospective STEM teachers are motivated to teach in low income districts by their knowledge of the learning needs of low socioeconomic status students. This suggests that attracting prospective teachers from such communities with similar life experiences may be an effective way to increase quality teachers in low-income areas. Successful efforts have focused on attracting teachers into teaching careers that use a "grow their own" model that partners school districts with universities. Several programs have developed recruitment pipelines for students in school districts by providing teacher preparation development activities and academic support for the students as they move through secondary schooling and into college (Au, 2002; Hunter-Boykin, 1992).

However, the findings of this study suggest that recruitment efforts to attract high quality science and mathematics teachers into low socioeconomic schools and districts should not discount teachers who want to teach STEM and help children learn, even if the recruits do not come from similar situations themselves. In this respect, recruitment efforts that focus too narrowly on attracting under-represented minorities to STEM teaching may be discounting a group of potentially interested teachers. Prospective teachers can understand and meet the learning needs of low socioeconomic status students even though they are not from socio-culturally diverse backgrounds themselves. For example, life experiences through work or church in communities characterized as low socioeconomic status may be associated with interest in teaching in low income or poor school districts. For many teachers, the desire to help others learn is the primary reason to teach. Creating opportunities for science and math majors to tutor students or to work with adolescents from under-served populations may appeal to STEM majors' desire to help others, a potential teacher recruitment activity. Such opportunities may provide the appeal necessary for these STEM majors to consider teaching careers.

APPENDIX A

Science Questionnaire Part II
Please read the following scenario and respond to each of the statements below.

A student of yours comes to class every day. His participation in class discussion indicates he is engaged with the material. He brings his book with him to class everyday but rarely turns in a completed assignment. You would like to discuss the student's performance with his parents, but they do not attend the parent-teacher conferences.

1. This student lacks motivation to complete class assignments. Agree or disagree. Why?
2. This student thinks homework is not important. Agree or disagree. Why?
3. This student does not know how to follow directions. Agree or disagree. Why?
4. What do you think may be factors influencing the student's performance?

APPENDIX B

Math Questionnaire Part II

Please read the following scenario and respond to each of the statements below.

A student in your algebra math class is having difficulty with her assignments particularly with the word problems. She arrived late in the school year, and is living temporarily with relatives. You ask her to stay after school for tutoring on her assignments, but she keeps breaking her appointments.

1. This student needs tutoring on math concepts. Agree or disagree. Why?
2. This student is unmotivated to learn new math concepts. Agree or disagree. Why?
3. This student does not know how to follow directions. Agree or disagree. Why?
4. What do you think may be factors influencing this students' performance?

APPENDIX C

Example of Matrix of Descriptive Codes Grouped into Two Categories:

Description	Joseph	Andrew	Tanya	Paul	Madeline	Elaine	Maggie	Matt	Karen	Martha	Samanthi	Dana	Edward	Tami	Lana
Characteristics or situations that impact learning															
Low-income students' have complex life circumstances that challenge their opportunities to learn.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Low-income students' compared to LNS have limited access to educational opportunities and resources that academically disadvantage HNS.	X	X				X	X					X	X		
Low-income students' have diverse learning styles and needs.			X	X		X	X	X		X					
Characteristics and attributes of Low-income students' families															
Low-income students' and parents compared to LNS and parents treat teachers with more respect.		X	X	X								X			
Low-income students' parents have complex life circumstances that challenge their opportunities to be involved in their child's schooling	X	X				X			X			X	X	X	

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CHAPTER 3: OTHERNESS AND EXPERIENCE WITH DIVERSE OTHERS AS A LENS FOR REVEALING PROSPECTIVE SCIENCE AND MATH TEACHERS' BELIEFS ABOUT STUDENTS AND FAMILIES FROM UNDER-RESOURCED SCHOOL DISTRICTS

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ABSTRACT

This study used social *otherness* and experience with diverse social *others* as an interpretive lens to examine prospective science and math teachers' beliefs about students and families from under-resourced school districts. Participants who experienced otherness or who had positive experience with diverse social others tended to seek multiple explanations to understand the forces that impact student and parent school participation. The findings highlight experience with *otherness* and diverse social *others* as valuable sources of knowledge prospective teachers bring to teaching. Implications of the study support the need to develop prospective teachers' self-identities to develop critical views about social others.

Keywords: Attitudes, beliefs, high-needs schools, otherness, teacher preparation

INTRODUCTION

A concern among policy makers is the demographic divide between teachers and students may contribute in part to the educational disparities that diverse students experience (Cochran-Smith 2004; Gay, 2000). The teaching workforce is predominately made up of teachers who come from White middle class backgrounds (86%) compared to 44% of the student population who is from ethnically diverse (National Center for Statistics, 2009). A growing body of literature is starting to reveal an association between diverse students' positive academic outcomes and their teachers who come from diverse backgrounds (Clewell, Puma, & McKay, 2005; Dee, 2004; Ehrenberg & Brewer, 1995; England & Meier, 1986; Evans, 1992; Hanushek, 1992; Hanushek, Kain, O'Brien, & Rivkin, 2005; Haycock, 2001; Klopfenstein, 2005; Villegas & Davis, 2008;Villegas & Irvine, 2009). Studies have shown diverse teachers work to build bridges between their students' families and communities and schools that contribute to a humanistic pedagogy. Diverse teachers develop strong relationships with students' families and draw on students' cultural and community resources (Flores, & Day, 2006; Foster, 1990; Ladson-Billings, 2009).

Teachers' perceptions about students' abilities are associated with students' race, class and gender (Gollnick & Chinn, 1998; King, 1993; Sadker & Sadker, 1994; Sleeter, & Grant, 1992). Teachers demonstrate lower expectations for classrooms with high proportions of students from low socioeconomic, culturally and linguistically diverse backgrounds (Irvine, 2003; Kozol, 1991; Valenzuela, 1999). Teachers' pedagogical choices about curriculum and instructional practices for diverse students are less

academically rigorous and often emphasize rote instructional practices, discipline and control (Banks, 1994; Dusek, 1985; Knapp & Woolverton in Banks 2004). Furthermore, administrators and teachers disproportionately group students from low socioeconomic, cultural and linguistically diverse backgrounds into low ability groups and academic tracks (Dusek, 1985; Irvine, 2003). A significantly less proportion of diverse and low-socioeconomic students are enrolled in general academic courses and advanced science and math courses (Oakes, 1990). In contrast, students from affluent and White European backgrounds are over-represented in advanced math and physical sciences courses and gifted programs (Ford, 1996; Irvine, 2003).

Given the importance of training prospective science and math teachers for diverse classrooms (Darling-Hammond, & Bransford, 2005; Villegas & Lucas, 2002), we became interested in understanding more about the beliefs that our pre-service science and math teachers, who have made the decisions to teach in under-resourced schools, will bring to the task of teaching diverse students. Since teachers' beliefs greatly impact teaching decisions about students and their learning (Isenberg, 1990; Johnson, 1992), we wanted to better understand our pre-service teachers' beliefs about students and families in under-resourced schools. Specifically, w*hat beliefs and views do prospective science and mathematics teachers have about students and families from low income or poor households? How if any, do these beliefs differ across prospective science and math teachers' experiences with otherness?* Understanding how these particular teachers view the worlds and lives of the students they will teach and their families will deepen our understanding of the underlying beliefs that accompany a group of pre-service science

and math teachers who have made commitments to teach in under-resourced school districts.

THEORETICAL FRAMEWORK

Otherness and Commitment to Diverse Others

Othering identifies a normative group by which all others are compared and contrasted against as other, or different than primarily White European, middle class and monolingual English speakers (Tuhiwai Smith, 1999). Membership with a social, cultural or linguistic other is a process of identity making that privileges one group over another. Thus, individuals or groups who come from low-income households, or who are bilingual, and culturally diverse are *diverse others.* In naming and identifying the *other*, attention is drawn to their position of subordination that emphasizes their experiences within a socially and historically constructed context based on inequitable power structures (Ladson-Billings & Tate, 1995; Soloranzo & Yosso, 2002). To foreground *others'* experiences challenges the traditional discourse. Groups that have been historically marginalized have often been silenced. In this study, those who experienced *otherness* are theorized as valuable sources of knowledge and experiences (Delgado Bernal, 2002; Gonzales et al. 2005).

Critical multicultural theory emphasizes the value of experience as knowledge or experiential knowledge (DeCuir & Dixson, 2004), where knowledge is socio-culturally constructed, and influenced by personal, cultural, and social factors (Giroux, 1983). Ways of knowing and understanding are revealed through the collection of narratives, testimonies and counter-stories that reveal alternative explanations of the educational

phenomena associated with subordinate groups. Evidence from the literature on preparing teachers for diversity and global populations advocate teacher immersion experiences in communities that are different from their own, to create opportunities for pre-service teachers to experience otherness (Merryfield, 2000). Opportunities to experience difference creates situations for cognitive dissonance, or dilemmas, that force pre-service teachers to interrogate their experiences and self-identity. To understand one's own social position serves to develop pre-service teachers' awareness of otherness. This developed awareness of otherness is an essential step in developing an ability to critically reflect upon the experiences of those who have experienced subordination as a social, cultural or linguistic other (Goodwin, 2010; Merryfield, 2000; Sleeter, 2001).

Prospective and practicing teachers' personal experiences as social and cultural others influences their professional decisions to become teachers (Quiocho & Rios, 2000; Sleeter, 2001). Their understanding of students' lives beyond school, the day to day negotiations needed to navigate social, cultural, and linguistic borders and public and private spaces serve as a lens through which prospective teachers from diverse backgrounds view their role as teacher. Diverse prospective and practicing teachers contemplate their role as teacher to be an important responsibility. They view part of their responsibility as teacher to include serving as a minority role model. They accept the responsibilities and role of teacher for diverse students with honor, a role which teachers believe can be used to leverage positive change in students' schooling and lives (Guyton, Saxton & Wesche, 1996; Su, 1997). Studies have demonstrated that diverse pre-service teachers express a deeper commitment towards diverse students in contrast to prospective

teachers who predominately come from White European middle class backgrounds (Montecinos 1994; Sleeter 2000; Su 1997).

Teacher Beliefs

Practicing teachers' classroom actions and decisions are driven in part by their confidence in their conceptions about students (Grant, 1990; Nespor 1987; Pajares 1992). Beliefs are complex systems made up of one's perceptions, assumptions, understandings and ideas about the world. Competing and contradictory ideas and values can comprise a person's belief system that can be deeply stable and unyielding to evidence. One constructs a belief system through a series of interactions between one's previous knowledge, experience and belief in such a way that a belief is reinforced or transformed (Aguilar & Pohan, 1996; Rios, 1996). Teachers' personal experiences with others are one way to gain knowledge and understanding. However, one draws from various sources other than direct personal experiences to construct meaning of ones' world. Literature, multimedia, or observing the lives of others can have profound influence on a teacher's belief system and how they view their students and families (Triandis, 1971). In the absence of direct experience, teachers will rely on stereotypical images and majority attitudes to fill the gaps in their knowledge (Aguilar & Pohan, 1996).

Perceptions that pre-service teachers have about students who come from low income households, or who are culturally and linguistically diverse, characterize these students as lazy, lacking motivation and discipline, and indifferent to school (Brand & Glasson, 2004; Garcia & Guerra 2004). Beliefs pre-service teachers hold about families support a cultural deficit, i.e. students learn these behaviors from their parents because

parents are less supportive and non-caring about their children's education compared to their more affluent peer students (Hidalgo, Sui & Epstein in Banks 2004). Implicit in pre-service teachers' stereotypical perceptions is the belief that students and families can change their academic and social positions if they acquire the appropriate attitudes and behaviors (Biddle, 2001). Attributes associated with failure are also viewed as cultural deficits that students and families from different ethnic backgrounds must overcome (Nasir & Hand, 2006). The deficit perspective does not address the greater forces of social structures and processes that lead to inequitable opportunities for students and families that impact teaching and learning (DeCuir & Dixson, 2004; Solorzano & Yosso, 2002).

In this study, we used the framework of otherness and experience with diverse others as a lens to interpret, analyze and understand Scholars' beliefs and knowledge about students and their families who come from diverse communities and backgrounds. This work sought to characterize alternative views using *otherness and experience with diverse others* as a lens to deepen our understanding of the underlying beliefs that accompany a group of prospective science and math teachers who have made commitments to teach in under-resourced school districts. An inspection into prospective teachers' lived experiences with *otherness*, their prior knowledge, and positive experiences with diversity are used to reveal a counter story to the deficit perspective reported about socio-culturally diverse students and students for low-income backgrounds.

THE STUDY RATIONALE AND RESEARCH QUESTION

We sought to characterize pre-service teachers' beliefs by examining their attitudes and understandings about students and their families who come from low income or poor households. Specifically the study was conducted to answer the following question:

1. *What beliefs and views do prospective science and mathematics teachers have about students and families from low income or poor households?*
2. *How if any, do these beliefs differ across participants' experiences with otherness?*

We used interpretive methods to identify the beliefs of 15 pre-service teachers who participated in a National Science Foundation (NSF) Robert Noyce scholarship program. Participants enroll in a College of Science-based teacher preparation program to pursue teacher certification in secondary mathematics or science. All of the participants who consented to be in the study made prior commitments to teach in under-resourced school districts as a stipulation of their scholarship. These districts have high percentages of students who are eligible for free or reduced price lunch, one of the criteria for inclusion as an eligible under-resourced school district in the Noyce Scholars program. For example, 84% of the students enrolled in one of the college's partner districts are eligible for free or reduced lunch prices through a government program for poor or low income families.

Data Collection

Data were collected as narratives, counter storytelling, family histories, biographies, and scenarios, that contest traditional research methods to explain the experiences of social others (Delgado Bernal, 2002; Gonzales et al. 2005; Soloranzo & Yosso, 2002). Data collected included each participant's written responses to a questionnaire administered during their first semester as a Noyce Scholar, the transcript from two semi-structured interviews, the Noyce Scholar program application that included a personal statement about teaching and transcripts, and observer's notes from two focus group discussions. Interviews were conducted by the first author with each study participant prior to the start of his/her second semester of participation in the program. Focus group discussions were conducted by the second author during spring 2007 and 2008. Focus group discussants included Scholars who were supported by the Noyce program. Observation notes during the focus group discussions were taken by the first author. Interviews and the focus group discussions were audio recorded.

Data Analysis

Critical Race Theory emphasizes experiential knowledge of groups of people who have be marginalized, either by race, ethnicity, language, class, gender, age, or other means of being othered. Experiential knowledge is central to bringing forth the voices of others and is considered a unit of analysis (Delgado Bernal, 2002; Soloranzo & Yosso, 2002; Tuhiwai Smith, 1999). In this study, Scholars were asked through interviews, questionnaires and focus group discussions to elaborate on their early schooling experiences, what life was like for them growing up in their town or city, and why they

chose teaching careers. These data provided an understanding of the autobiographical experiences fifteen Scholars had as children and young adults that were used to identify how, if any, Scholars were othered or had experiences with diverse others, and to what extent those experiences were. Three groups of Scholars were identified, those that had been othered, those who had positive experiences with social others and those who had limited or no experience with otherness.

Particular interest in how Scholars' varied experiences as being othered or having positive experience working with diverse others was used as a lens to inspect Scholars' beliefs of low-income or poor students and families. Otherness or association with an out-group included Scholars who had limited access to privileged normative cultural and linguistic practices, resources, and cultural symbols (Delgado Bernal, 2002; Tuhiwai Smith, 1999). Social others are viewed as not sharing similar understandings, practices and behaviors valued by the majority White, European middle-class. Scholars who were othered grew up in bilingual, bi-cultural, low-income or poor, or in low-income communities. Some Scholars grew up in single parent households, were first generation college goers, older returning students, single parents, parents of different ability learners, or who themselves are different ability learners. Scholars who had positive experiences with diverse students and families did so through early teaching opportunities in and out of school, such as tutoring math or science, or teaching Sunday or bible school, dance, and swimming. Other Scholars lived in diverse communities, or spent a significant time in a community different from their own. Below are brief summaries of Scholars' experiences with otherness that represent the range of Scholars' experiences.

Scholars' Experiences with Otherness

Andrew grew up in an ethnically diverse community, and moved later to an ethnically homogenous community during his secondary schooling. Andrew is of Mexican descent. He grew up in a low-income household, and school in a diverse community. His outgroup status also includes being a child of parents who did not speak English. When Andrew transitioned to his new secondary school, he had to advocate for himself to not be placed into English Language Learning courses, and to be placed in mainstream math and science courses. He describes a struggle to convince his school teachers and administrators to place him in advanced AP science and math courses when he became bored in his regular math and science courses. Andrew worked as a para-professional in an elementary school with a high proportion of children who spoke Spanish, Andrew's first language. His ability to serve as an informal interpreter for parents who spoke Spanish, and school staff who spoke English, gave Andrew a sense of agency to pursue a science teaching career in a bi-lingual high school. Andrew represents a Scholar who is both othered and experienced with diverse others.

Edward grew up in a rural community in a midwest state. He is White European. Edward attended school in various school districts during his early schooling years, moving often each new academic year. Edward is an older non-traditional student who took classes for several years at a community college prior to attending the university. He is the first in his family to attend college and graduate. He is a divorced father of three school age children. His first exposure to teaching was at his church teaching bible classes. Edward represents a Scholar who is othered.

Dana is from a White European middle class background. She described living in an under-resourced school district located in a large Southwestern urban metropolis. She described the community she grew up in as diverse. As she progressed through school, her mother advocated for Dana to enroll in a school outside her designated school district in which she was bussed out to a school where she would be able to take advantage of a more progressive teaching and curriculum than the school in which she would have been required to enroll. Dana excelled in honors courses and had various experiences tutoring students in math as an undergraduate. She is also a dancer and had taught dance to as young as children to adult women. Dana represents a Scholar who is experienced with diverse others.

Martha and Suzanne are two Scholars who experienced a normative White European, middle class and monolingual female upbringing. These Scholars represented neither an othered life experience or experience with diverse others. Both Martha and Suzanne participated in honors or gifted school programs throughout their primary and secondary schooling. They had little, if no, experience or exposure to social others. Thus, Martha and Suzanne had limited knowledge about students from diverse backgrounds. They led insular lives. Both Martha and Suzanne, represent a deficit perspective about students and families from diverse backgrounds. The alignment of their beliefs with the literature on deficit models serves in contrast to the emergent findings in this paper and will be discussed at the end of the findings section.

FINDINGS

Scholars who experienced otherness or who had positive experience with diverse others revealed two findings about Scholars' beliefs about students and families who come from low-income communities.

1. *Scholars believe that low-income students' lives are complex with many factors outside their control impacting the students' learning opportunities.*
2. *Scholars believe parents and schools have incongruent expectations about parents' roles in their children's schooling.*

Finding 1. Scholars believe that low-income students' lives are complex with many factors outside their control impacting the students' learning opportunities.

Scholars expressed complex beliefs about students and the social context which they live. When characterizing students from low-income households, Scholars sought to provide multiple explanations to describe and make sense of students' lives. They acknowledged students' lives can be unstable and unpredictable. In the absence of personal experience or more information, Scholars resisted labeling or making broad statements about students. Beliefs held by Scholars can be traced to Scholars' personal experiences, or encounters working with diverse students. Below, Joseph described an example of his personal experience which he believes may be characteristic of students who grow up in a low-income household. He talks about how it may be easy to make claims about students who do not come to school, and stereotype them as students who

do not want to attend school. Joseph's experience as a *social other* framed his belief that students have extenuating circumstances that prevent them from attending school.

> *It's easy to say, "Oh these students don't come to school because they don't want to or whatever." But I can remember myself having to stay home from school and help take care of [my] smaller siblings. Or a lot of times there are family issues going on where you don't have both parents, so the parent can't deal with everything, so you end up having to cover some of that. And so it's not that you don't care about school, it's just that your family always comes first and that needs to get taken care of before you can think about everything else (Joseph, interview).*

Scholars recognized many factors outside students' control that impact their opportunities to learn. The well-being of the family is a priority among parents and children from low-income homes. To ensure the family's well-being, single parent households often rely heavily on their older children for assistance in place of an adult who would normally help. A large portion of the familial responsibilities are often shouldered by older children and children who are particularly adept at caring after siblings, or assisting to support the family. Below, Samanthi describes the potential urgency for a student to attend to the family's needs first and foremost in order to support the family. Thus, a family's well-being takes priority over homework. Dana similarly describes a parent's dependency on their child to care for a sibling as a potential explanation that may contribute to a student's excessive absence at school.

> *If there are additional responsibilities that students have outside of class then they may have to take care of those needs first. It might not be that he thinks homework is not important at all. However, if the student is more worried about supporting his family or taking care of siblings, then that will obviously take priority over homework (Samanthi, questionnaire).*

> *Many students have excessive absences, because they are required to play the role of mother or father to their siblings. When Mom is working two jobs to make ends meet, she sometimes asks her child to stay home and watch a sick younger sibling as she cannot take off work (Dana, questionnaire).*

Maggie has demonstrated a commitment to working with youth who are under-served. During her first year as a college student, she spent an alternative spring break working with homeless children in Los Angeles, California. Her experience working with low-income communities and children informed her understanding of the life challenges children confront. Children living with poverty experience lower health status, lack of food security and homelessness. Below Maggie describes how limited access to health care contributes to keeping children out of school. She explains untreated illness may prolong students' poor health and return to school. Similarly, Lana describes her experience with a student she had while student-teaching who was chronically absent due

to exposure to black mold, a condition exacerbated by the student's limited access to proper health services. In response to a scenario on a questionnaire, Dana made a conjecture about a student's basic living conditions that can further impact a students' ability to perform in school, including homelessness and hunger. Scholars demonstrated an understanding that students live under distressed conditions that impact their opportunities to learn.

> *The students also could be ill, maybe from an easily curable illness, but due to lack of health care the child is sick for a longer period of time (Maggie, questionnaire).*

> *Her [bedroom] wall fell apart, and there was black mold all throughout her room. I don't know if it's [a] chronic [disease that will affect her] throughout her life. Part of the problem is they can't afford to go to the doctor (Lana, interview).*

> *Plenty of things could be going on when that student steps outside of the [classroom] door... Perhaps he is homeless and more concerned with eating and safely sleeping than finding a pencil and paper for homework assignments (Dana, questionnaire).*

Scholars expressed a conception of the forces that lead to higher health risks and poor health status among students in poverty. The social structure within which children

in poverty live limits their access to resources, as Maggie and Lana describe above. Both Joseph and Edward describe access to social resources and the relationship to children's risk of gang activity. For example, Joseph sought to describe the context that lead to gang activity as an issue connected to the social conditions of poverty. Edward describes gang membership as young people's response to their limited life opportunities, choices and resources. Young people who are part of gangs are seeking ways to counter or resist their marginalized status in society. Gang membership is a mechanism by which young people can empower themselves and have authorship over their own social identity (Giroux, 1983).

> *I was just going to say social issues that maybe come along with poverty. I don't know [but] I think [there are] youth gangs and stuff that might be found more around poverty and maybe [poverty] affects probably a lot of it. (Joseph, focus group)*

> *My perception is that there would be a greater problem in a higher need area than a lower need area, and that might go back to the fact that there is less resources so to be empowered these students need to group together and rely on a group for that sense of power and person, that sense of being, [an] identity (Edward, interview).*

Scholars believe students from diverse backgrounds experience challenges in school that impact their learning opportunities. Scholars believe students have a desire to

learn and enjoy learning when teachers create learning environments that draw on students' interests and knowledge. Teachers make decisions that create barriers to learning. Furthermore, schools do not provide adequate resources, including material and human resources, which disadvantages students who attend school in low-income districts. In the excerpt below, Andrew reflects on his experience as a school age student learning math. Andrew was particularly good at math but had difficulty at times with word problems because examples in his textbook used scenarios related to events and processes unfamiliar to him.

> *You can really only understand the math word problems if you come [from] certain regions. Like I think in the south, [compared to] if you're from the east coast they're more relevant sometimes (Andrew, focus group).*

Scholars recognize students' learning experiences can be influenced by decisions teachers make while teaching. Teachers who are not adept at recognizing and addressing the gaps that may occur between instruction in class and students' learning may make the assumption students do not care about school or are unmotivated. Suzanne has limited experience with diverse students and English Language Learners (ELLs). She was asked to explain what factors might contribute to a student to not turn in his assignments – she explains in the excerpt below that a student's language learner status is an indicator of a student's motivation. Suzanne, who has not experienced otherness or who has had positive experiences with social and diverse others made a statement that generalizes

ELL students are not motivated to learn. In contrast, Tami who has had positive experiences with diverse others recognizes learning and academic success is complicated when a student is learning science or math in a second language. A student may struggle privately and fall behind in their course work because the teacher is not able to respond adequately to a student whose English is not their primary language.

> *This student might be an ELL and not be good at reading English and therefore does not try doing the homework. He might bring the textbook to class simply because he is supposed to (Suzanne, questionnaire).*

> *A second factor that could be affecting the student's performance is that he is an English Language Learner. Just because he is able to effectively communicate with his peers during a class discussion does not mean that he has a complete control of the English language. He may have a lot of difficulty writing and reading directions in English, which is why he doesn't turn in assignments. He might understand the pieces that the teacher went over in class, but since the teacher probably only goes over a small portion of the material, the student is probably confused for the rest of the assignment and may be too afraid to ask for additional help (Tami, questionnaire).*

The classroom environments that teachers create impact diverse students' ability to participate. In many cases, teachers send a message to students that the classroom is not a welcoming place for them.

Finding 2. Scholars believe parents and schools have incongruent expectations about parents' roles in their children's schooling.

Scholars expressed an awareness that there is an incongruence between schools' and parents' expectations about parents' roles in their children's schooling. In schools that enroll a large proportion of students whose parents' primary language is not English, schools send notes home in English, expect parents to be able to converse and communicate with teachers in English, or expect students to serve as a translator. One example where parents are expected to participate in their child's education is at teacher/parent conferences. Scholars recognize challenges that parents who come from low-income households need to overcome in order to attend teacher/parent conferences. Parents must negotiate work schedules to attend during school hours, for some communicate in a second language, coordinate and arrange transportation and child care. Parents who cannot overcome these challenges are at risk of appearing as though they do not care about their child's education. Lana described below how she believes the school environment can be intimidating for a parent who is a non-English speaker. She recognized that her own role as a monolingual English speaker and her position of power as a teacher can contribute to an intimidating environment. She also articulated a different way to understand of recognize how parents do care about their child.

> *Sometimes I think the school environment is intimidating, and [a lot of parents]can't speak English. So talking to me, a White person [who] can't speak Spanish, I think it's intimidating...I had parents who [would] come and can't speak English and their kids try to translate. I just think that' its a timing thing, the transportation thing, an environment more than they don't care. Because, otherwise why would their kids be in school? So why would they be turning any homework in? They are clothed and they have clothes. Their parents care about them (Lana, interview).*

In the excerpt below, Maggie and Tanya discuss similar reasons for what may influence parents' attendance or participation in a parent/teacher conference. Scholars described practices schools enact that make it difficult for parents to engage and communicate with school teachers and administrators. Parents are not fully aware of their role and responsibilities related to school involvement. The ambiguity leads to a strained relationship between parents and school. School practices work to distance parents, preventing them from being able to participate in their child's schooling. The effect is an unwelcoming school environment.

> *Parents who do not attend [teacher/parent conferences] may have transportation issues, have to work, have many young children, or cannot read and understand if letters are sent in English (Maggie, questionnaire).*

> *Conferences are often scheduled at inconvenient times, are sometimes set up in a way that causes a parent to have to be at the school for many hours (often missing dinner or other work and family obligations), and often do not include any preliminary information that would give a parent some idea of what they can and should be discussing at the meeting (Tanya, Questionnaire).*

Parents who appear disengaged or do not care about their child's education may do so because of a difference in cultural practices and norms between teachers and parents. This tension between teacher and parent expectations is illustrated by Paul's comment below. Paul student taught in a predominately Latino community, he had a lot of experience working with diverse others. Yet, Paul described a belief often characterized in the literature that Latino parents are not involved in their child's education. At the same time Paul described how parents have respect for teachers' authority, an idea that Andrew expanded upon in the second excerpt below. As a diverse other, Andrew views the issue of parent involvement differently. He attributed the lack of parent involvement as an incongruence between parents who come from communities that are primarily Latino and low-income, and whose cultural beliefs and practices differ than White European middle class or affluent parents. Parents who have not been educated in the United States trust teachers' and the schools' expertise. Often parents appear to take a passive role in their children's education, relying on the school and teacher to take the primary role in meeting their children's educational needs. Parents'

reliance on the school's authority dictates how parents interact with school administrators and teachers. Andrew believes parents from low-income or diverse backgrounds see their role as supporting the teacher and school's decisions and opinions. Parents' support of the child's teacher and school is a different paradigm than what US schools and White European affluent parents view parents' roles.

> *This is predominately Hispanic [community], there is no parent involvement. But if a teacher calls a parent, they believe the teacher (Paul, interview).*

> *Parents feel that teachers are educated and know what is best for their children. These parents feel that they do not know what is best for their children since they did not attend college or the university. Parents generally want to be told what to do with their children because they feel teachers are experts in educating children. This is a completely different view from parents in high income areas (Andrew, questionnaire).*

Scholars believed children's parents and family are involved in school and care about their children's education. These Scholars described instances that contradict a stereotypical belief that Paul expressed above. They have experienced situations in which parents and families actively participate in activities related to their child's education. For example, Lana described her experience with students and their families at an astronomy

activity she required her students to attend. Lana encouraged her students to bring their parents and siblings. Much to her surprise a student brought her extended family.

> *Families can come to astronomy night so some people brought their siblings. Some people bring their friends. I tell them I just need them to check in with me so I know who is there. One student brought her whole family, parents, tías, and some cousins, I think (Lana, interview).*

Scholars who have experience working with diverse others or with schools as a diverse other, believe the relationship between schools and parents is complex. Factors related to language, cultural practices and norms that constrain how parents and schools interact. The incongruence between schools and parents roles and expectations must be resolved. Scholars like Joseph believe it is the responsibility of the school to build and develop partnerships with parents that support students' educational goals. Scholars believe parents play an essential role in their child's education, parents are willing to participate but need guidance in how to support their child's education. Joseph believes educators must develop a greater understanding of the complexity of the issues surrounding parents' lives and roles in their child's education. Schools must do more to cultivate a partnership based on a more humanistic perspective for the sake of their students' academic success.

> *The relationship that is most lacking in high need school districts is the teacher/parent relationship. Administrators and educators have not yet*

> *found the best way to connect with parents and part of that disconnect has led many parents to believe that they are not an integral part of the educational system. It is true that parents often work long hours and cannot afford to miss work. However, I do not believe that this issue is what holds back parents. It is this idea that a student's education is between the student and educator. They do not see the more complex issue and I do not believe that educators have done their part to show parents what is at stake (Joseph, questionnaire).*

Scholars' had complex understanding of the social context that challenge students' opportunities for learning. Scholars who have had experiences of being othered, or experience with diverse students and families, in particular, were able to imagine multiple possibilities and the nature of students' and families' experiences that could account for their participation at school and relationship with educators. Scholars' believed that students and parents negotiate around multiple social, cultural and linguistic challenges in order to gain access to learning opportunities and resources. Scholars recognize their challenges as starting places to build better school-student-parent relationships based on respect and affirming beliefs about students and families.

Deficit Perspectives That Contrast with Scholars who Have Experience with Social Otherness

In contrast to the Scholars' beliefs reported above, Martha and Suzanne's comments indicated a very limited and narrow perspective about students different from

themselves (see below). Common in their perceptions was a tendency to identify and posit the issues of self-motivation and parental values as problems associated with students and their families from low-income backgrounds.

> *I think that [students from low-income households] just would rather stay home and are not interested in what is going on at school. Many of the students are not held accountable. Their parents leave for work early and aren't there to make them go to school (Martha, questionnaire).*

> *My parents were very supportive...they always emphasized education was very important, but if his parents don't come to the teacher parent conferences that says they were too busy or they didn't care enough to come talk about their student's education. There is this lack of parent involvement, participation. They don't encourage their student in school (Suzanne, interview).*

Martha and Suzanne's lives and experiences did not intersect with those of social others in ways that brought about deep reflection on the forces that contribute to their social positions. As members of the majority normative group Martha and Suzanne had no cause to develop an awareness of their social positioning. Unable to recognize the need to know about the experiences and lives of social others, Martha and Suzanne relied on stereotypical beliefs to explain the behaviors and motivations of students and families different from themselves.

CONCLUSIONS

Pre-service science and math teachers who have experience with diversity either through their personal experience as being othered, or having positive experience working with those who are different from themselves hold complex understandings of factors that impact access to learning opportunities for students from low-income backgrounds. These understandings are built upon a variety of pre-service teachers' abilities to critically inspect their future students' access to learning. Pre-service teachers destined for teaching in under-resourced school districts holding critical perspectives like we found in this study, will likely begin the important work of "knowing" their students at a deeper level than pre-service teachers who have limited experiences with diverse others (Su, 1997).

Experiences with otherness provided a useful lens to make sense of the beliefs pre-service teachers held about students and families from under-resourced schools. Experience with otherness either by pre-service teachers' experiences being othered or having positive experiences with social others provided pre-service teachers with experiential knowledge on which they could draw to make meaning of the lives of their future students and parents (Delgado Bernal, 2002; Gonzales et al. 2005). A desire to teach in under-resourced schools can be explained in part by Andrew's shared experiences with his potential students. Andrew's perception of shared biographical experiences with students who are from low-income or poor backgrounds, or who are culturally and linguistically diverse, is the foundation that provides Scholars like Andrew with knowledge about their future students. Knowledge about Scholars' future students is an important factor in Scholars' career placement choice (Quiocho & Rios, 2000).

Otherness can also explain beliefs held by pre-service teachers who do not come from historically marginalized groups. Pre-service teachers had an awareness of their social positioning, such that they understood how their social positions as teachers from the majority normative background can potentially impact their relationships with students and their families. The inequitable power structures in which schooling takes place can create challenges for parents and teachers, especially for those who do not share similar language and cultural practices. For example, Lana expressed an understanding towards students' parents whose native language, and cultural and diverse backgrounds are different than their children's teacher. Lana describes that a parent must feel intimidated when speaking to a teacher like herself who is White and only speaks English. These interactions can present challenges to building relationship with parents and teachers. However, Lana's positive experiences with social others allowed her to open herself to be understanding and sympathetic to the social and cultural borders her students and their parents must negotiate between home and school (Goodwin, 2010; Merryfield, 2000).

Pre-service teachers who come from diverse backgrounds express a deeper commitment towards diverse students than those who come from predominately White European middle class backgrounds (Montecinos, 1994; Wiggins & Follo, 1999). Prospective science and math teachers in this study who have experienced otherness expressed a deep understanding about students and their families from low-income backgrounds, regardless of teachers' ethnic backgrounds. Prospective science and math teachers' commitment to teach in under-resourced school districts is driven in part by their understanding for the challenges students and their families' face due to the

complexity of their lives. In the Southwest where this study took place, these districts enroll a high proportion of students from culturally and linguistically diverse backgrounds. Prospective teachers who have had positive experiences with social others also demonstrate characteristics of teachers who are successful teaching diverse students (Nieto, 2005).

IMPLICATIONS

The study supports the need to develop prospective teachers' self-identity to develop critical views about social others (Banks, 1994; Sleeter, 2008). To understand one's own racial identity can shed light on the racial hierarchy in which one is positioned. Awareness of positions of privilege and power associated within a racial order is one step toward understanding diverse other's social positioning and experiences within a larger context of education (Carrington & Saggers, 2008, 2010; Goodwin, 2010; Sleeter, 2001). Developing a teacher workforce prepared to meet the learning needs of a diverse student population must include providing opportunities for prospective teachers to consider their own lives and the lives of others in ways that push prospective teachers' assumptions and beliefs about those who are different from themselves (Sleeter, 2001).

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CHAPTER 4: SOCIAL CAPITAL BROKER: A LATINO SCIENCE TEACHER'S EMERGING PROFESSIONAL ROLE THAT UNDERLIES A COMMITMENT TO TEACH IN A BILINGUAL URBAN SCHOOL

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ABSTRACT

This study investigated bridging identities that shaped a Latino prospective teacher's commitment to teach science in an under-resourced and bilingual school. The investigation used narrative identity and role identity as analytical tools to reveal bridging identities that inform a teacher's emerging professional role identity. Three bridging identities 1) language broker 2) urban poor family member, and 3) immigrant advocate were identified. These bridging identities align with the experiences of the teacher's students and shape the teacher's emerging professional role identity as social capital broker. The teacher's emerging professional identity includes a moral obligation to assist his students and their families to be able to successfully negotiate cultural, social, and institutional structures. Respect and an appreciation for his students' knowledge are values this teacher ascribes to his emerging professional teacher role identity.

INTRODUCTION

When teachers and their students share similarly diverse sociocultural and linguistic backgrounds, student performances in the areas of standardized testing, school attendance and retention, advanced-level course enrollment, and college-going rates show positive academic outcomes (Clewell, Puma, & McKay, 2005; Dee, 2004; Ehrenberg & Brewer, 1995; England & Meier, 1986; Evans, 1992; Hanushek, 1992; Hanushek, Kain, O'Brien, & Rivkin, 2005; Haycock, 2001; Klopfenstein, 2005; Villegas & Davis, 2008;Villegas & Irvine, 2009). Studies have shown that diverse teachers draw on their shared biographical experiences with students to develop a humanistic pedagogy, one that works to build strong interpersonal relationships (Foster, 1990). Furthermore, diverse teachers demonstrate their abilities to use their students' cultural, social and linguistic resources to make meaningful connections between students' lived experiences and the classroom (Au, 2002; Delgado Bernal, 2002, Galindo, 2007, Landson Billings, 2009). When teachers incorporate students' knowledge and understandings with purpose and intent in the classroom, students from diverse backgrounds experience positive learning gains (Au, 2002; Garcia, 1993).

However, efforts to recruit diverse students into teaching have resulted in a less than significant matriculation of teachers from diverse backgrounds. For example, only 2% of teacher candidates are from Hispanic/Latino backgrounds (Ingle &Castro, 1993). Furthermore, recent trends indicate that diverse teachers are leaving the teaching profession at a greater rate than their White European teacher counterparts (Ingersoll & Connor, 2009). Retention may be more problematic for Hispanic/Latino teachers, who

made up the largest group of teachers that left the profession during the 2003 – 2004 academic year. Understanding factors that shape Hispanic/Latino prospective teachers' commitment to teach in hard-to-staff schools can contribute to efforts to effectively attract and retain potential teacher candidates.

In addition, diverse teachers (14%) and teacher candidates (7-20%), represent a small proportion of the current and future teacher workforce, relative to the proportion of ethnically diverse students (44%). Six percent of the teaching workforce is Hispanic/Latino compared to 21% of Hispanic/Latino students (The Condition of Education, 2007). Yet, a greater proportion of teachers from diverse backgrounds compared to their White European counterparts, work in hard-to-staff, urban poor schools (Achinstein et. Al, 2011). Diverse teachers also remain in hard-to-staff, urban poor schools at significantly higher numbers than teachers across all settings (Cochran-Smith, 2004; Haberman, 1990; 2001). Therefore, diverse prospective teachers' experiences represent a rare and untapped source of knowledge and understandings that could shed light on mechanisms to increase the diversity of the teacher candidate pool (Delpit, 1995).

Overall, the challenge for teachers and schools to adequately meet students' learning needs continue to contribute to the persistent educational disparities that diverse poor students experience, particularly in science and mathematics disciplines (Oakes, 1990; Banks, 1996). Students from low income and poor households are three times less likely to perform at or above a proficient level in science and mathematics compared to their affluent counterparts (Educational Longitudinal Study, 2002). Racial and ethnically diverse students are twice as likely as their White counterparts to achieve proficiency

levels in mathematics (Educational Longitudinal Study, 2005). Given the conditions described in this introduction, I became interested in understanding how one Latino prospective science teacher's experiences shaped his commitment to teach in an under-served and bilingual school. I was particularly interested in understanding how his biographical experiences shaped an emerging professional role identity as teacher of students of poor urban families whose primary language is Spanish.

THEORETICAL FRAMEWORK

Role and Narrative Identity

Role identity is the way individuals think about themselves, a construction of self-images (Somers & Gibson, 1992). Emphasis is put on the personal viewpoint of the individual, where he or she narrates their own self-image. Self-narration thus gives recognition to an individuals' power over authorship in shaping his/her identity (Delgado Bernal, 2002; Soloranzo & Yosso, 2002; Tuhiwai Smith, 2005). Identity is also related to a history of events and experiences as negotiated within the context of existing cultural practices and cultural histories (Enyedy et. Al 2005; Wenger, 1998). Role identity in turn is constrained by micro and macro interactions, or interpersonal and institutional relationships and structures. These interactions take place in the day to day interactions between individuals in school and with policies that govern institutions. Furthermore, historical, cultural and political context constrain an individual's interactions.

Narrative identity is the self-narration of one's biographical experiences. In the narration itself one's self image is shaped. The narrative identity purposefully rejects

objectivity and assumes subjectivity by providing the individual ownership of their identity formation (Somers & Gibson, 1992). Moral meanings, values and beliefs of the individual are embedded in the narrative such that the projected self-imagine reflects such meanings. As the individual works to shift and locate oneself within the narrative (s)he positions her/himself to fit some ideal image of self. Thus, the narrative serves as a vehicle that informs an ideal self-image which ascribes morals, values and beliefs that guide future behavior (Galindo, 1996; Knowles, 1992).

Narratives are how people come to know and make sense of their world (Delgado Bernal, 2002; Soloranzo & Yosso, 2002; Tuhiwai Smith, 2005). The telling and re-telling of a story is not simply the re-counting of biographical experiences in chronological order. Narrative theory presumes that through employment, the individual engages in a cognitive arrangement of his/her experiences to create a meaningful plot that directs identity (Knowles, 1992; Somers & Gibson, 1992). An individual can construct multiple narratives to integrate and to make sense of their past and present experiences. The narrative serves to incorporate new experiences, events, and interactions, between and among other agents, relationships forged formally or informally. These relationships and interactions are constrained by social, economic and cultural structures and practices. The narrative must account for discrepancies and inconsistencies, by reshaping and re-arranging experiences and events to fit the ideal identity, thus morals, values and beliefs previously prescribed (Bertaux & Kohli, 1984, Freeman, 1984; Somers, 1992). This amalgamate of experiences and events is transformed into biographical schemes or what Galindo (1996) describes as “Bridging Identities”.

Bridging Role Identity

Bridging identities is an analytical tool Galindo (1996) employed to understand the links between Hispanic/Latino teachers' past biographical experiences with their role identity as professional teacher. Bridging identities is one way to validate and affirm the experiences and knowledge that Hispanic/Latino teachers bring to the profession of teaching. Studies have revealed that teachers' past biographical experiences of ethnic or language minorities link diverse teachers' roles of professional identity (Flores, & Day, 2006; Foster, 1990). African American teachers have reported the kinds of relationships they developed between family members and their communities gave them experiences that they drew upon to cultivate caring relationships with students in and outside the classroom (Foster, 1990). Knowing one's students well has been shown to be of foremost important in creating learning opportunities that are culturally responsive and relevant (Ladson-Billings, 2009). Shared life experiences, histories, and cultural practices has been a source from which ethnic and language minority teachers acquire knowledge about their students. The knowledge and understandings teachers have about their students are incorporated in their teaching with purpose and intent, and has shown learning gains for diverse students (Au, 2004).

Professional Teacher Role Identity

Prospective and practicing teachers' personal experiences as social and cultural others influence their professional decisions to become teachers (Quiocho & Rios, 2000; Sleeter, 2001). Their understanding of students' lives beyond school, the day-to-day negotiations needed to navigate social, cultural, and linguistic borders and public and

private spaces, serve as a lens through which prospective teachers from diverse backgrounds view their teacher role identity. Diverse prospective and practicing teachers contemplate their professional role identity as teachers for diverse students to be an important responsibility. They view part of their responsibility to include serving as a minority role model. Diverse teachers accept their role identity as teacher, and to be responsible for diverse students as an honor and a position of power. Teachers believe they are positioned well to use their roles to leverage positive change in students' schooling and lives (Guyton, Saxton & Wesche, 1996; Su, 1997). Studies have demonstrated that diverse pre-service teachers express a deeper commitment towards diverse students in contrast to prospective teachers who predominately come from White European middle class backgrounds (Montecinos 1994; Sleeter 2000; Su 1997). Studies of prospective teachers who come from diverse backgrounds reveal a heightened awareness of the educational inequities faced by socio-culturally diverse students (Su 1997; Montecinos 1994; Sleeter 2000). These prospective teachers believe their professional role identity to include agency for social change. They are committed to teaching students from poor and culturally diverse backgrounds (Sleeter 2000, 2001; Su 1997).

A review of the literature of effective Latina teachers described and characterized Latina teachers as committed, resourceful and persistent teachers (Garcia, 1993). Hispanic/Latino teachers, like African American teachers, establish caring relationships that extend beyond the classroom interactions, identified by Shannon (1995) as the concept of *carino* (affection and care). The affection and care that Hispanic/Latino teachers enact is an unrelenting commitment they have towards ethnic and language

minority students. Relationships that teachers cultivate with parents, family and community members is an extension of *carino,* cultural connectedness that promotes relationship building (Galindo & Escamilla 1995; Galindo et. al 1996; Galindo & Olgun 1996; Faltis & Merino, 1992; Gomez et. al. 2008; Yosso, 2005). A study that investigated Latina para educators (classroom assistants), reported that Latina staff worked intentionally to make visible in the classroom the everyday lives of students, and how their experiences impact the students in school performance and behaviors (Monzo & Rueda, 2001). Latina staff also drew on students' family and community resources and knowledge in the classroom and demonstrated solidarity with their students (Monzo & Rueda, 2001). Galindo (1996) identified themes associated with past biographical experiences growing up as Hispanic/Latino ethnic minority that defined teacher role identity, and thus agency to act. These themes included bridging role identity as under-represented minority students, monolingual Spanish speakers, and members of poor families (Galindo, 1996).

In this study, the frameworks of role and narrative identities, bridging identities, and teacher professional role identity are used to interpret, analyze, and understand the dispositions of a Latino high school science teacher who is committed to teach in a school with a high proportion of low-income, bilingual, Latino students.

THE STUDY RATIONALE AND RESEARCH QUESTION

This study is part of a larger investigation designed to understand attributes that underlie prospective and practicing STEM teachers' commitment to teach in under-

resourced school districts. The current study focused on one Latino prospective teacher who made a decision to teach science in an under-resourced bilingual school. The study addressed the research question: *What roles of identities shape a Latino prospective science teacher's commitment to teach science in a bilingual and under-resourced school?* Investigating roles of identity of Latino prospective teachers provides an analytical tool to understand how life experiences shape Latino prospective teachers' future career placement choices and emerging professional role.

The study took place at a land grant Research I university in the Southwest between December 2006 and July 2009. The study was designed to track Andrew's (pseudonym) progression over time from his last two years of teacher education through his first year of teaching. Andrew was an undergraduate student who majored in molecular and cellular biology and pursued his teacher training in the university's college of science teacher preparation program. He was the first in his family to attend college. His early school experiences included attending an under-resourced school during his primary schooling years, and later attending a high school that served predominately middle to upper-income students and families. He grew up in a working class, poor urban household. The primary language spoken in Andrew's home was Spanish. Andrew graduated from college in May, 2008, with honors and immediately took a science teaching position at an under-resourced bilingual school. He is a former recipient of the National Science Foundation Robert Noyce Scholars Program at the university. The scholarship program provides a year of financial support to Noyce Scholars who agree to teach in an under-resourced school district for two years.

Data Collection and Analysis

This study was designed to reveal different cultural world views and identities through participant's own words, stories and self-representations in order to make meaning of his experiences (Bogden & Bliken, 1998). This narrative approach sought to give the participant voice and power to direct his own narrative and share his stories without manipulation by the investigator (van Manen, 1990). The narrative approach values context and place, such that a participant's story is situated so that nuances can be revealed (Clandinin & Connelly, 2000). The participant's narrative is a way of knowing and understanding the identity of oneself. The participant's telling of his story is the basis of what forms his narrative identity. His story is also a collection of narratives, testimonies and counter-stories that give rise to an alternative explanation and broaden the scope in which we come to understand educational phenomena (Ladson-Billings & Tate, 1995) .

Data collected for this study included Andrew's written responses to two questionnaires administered during the first semester as a Noyce Scholar and second semester of his first year teaching. The transcript from three semi-structured interviews (`45-60 minutes each) based on responses to the questionnaires and focus group discussion, the Noyce Scholars program application including a personal statement about teaching, transcripts and observers' notes from two focus group discussions, and email correspondences and field notes were collected and analyzed. Interviews were used to further explore Andrew's ideas and thoughts that arose from the questionnaire and focus group discussions.

Questionnaire responses, interviews, personal statements and focus group transcripts were analyzed using a reiterative method (Marshall and Rossman, 2006; Maxell, 2005). Data was analyzed to identify bridging identities that answer the research question. Starting with one interview transcript, the author made an initial pass at identifying emerging excerpts that related to commitment to teach in a low-income school district (Brand and Glasson, 2004, Marshall and Rossman, 2006; Maxell, 2005). After the initial pass of the data themes emerged that were binned into early biographical experiences. Segments of rich narratives that aligned with themes were extracted and developed into a case study to inspect Andrew's bridging and emerging role identity as teacher (Erickson, 1986; Miles and Huberman 1994). Themes were analyzed and an interpretation was drawn from the themes that represented Andrew's bridging identity. Three bridging identities were identified, and from these three identities an third round of interpretations were made, that led to the participants' emerging professional role identity.

A CASE STUDY OF ROLE IDENTITIES

Early Biographical Schemes: Bridging Identities

Prior to graduating from college Andrew made a commitment to teach science in an under-resourced school. He was first interviewed during his junior year in college as a participant in a larger study in which participants accepted a scholarship to teach in schools considered under-resourced. As the study proceeded it became apparent that Andrew had specific ideas about the lives, and in particular the responsibilities held by students from the population that he and others in his cohort would be teaching. Andrew's

initial comments and his declaration of career placement choice spurred the question: *What early roles of identities shaped Andrew's commitment to teach science in a bilingual and under-resourced school?* Andrew's insights were drawn from his personal experiences as a child and later as a para-educator. Andrew would attribute his experience as a para-educator as the experience from which he came to the realization he wanted to work in a school that enrolled a high proportion of students who spoke Spanish (see excerpt below). Andrew's early role identities as a child and para-educator shaped his interest to work with children who are English Language Learners (ELLs) and who are from families which are historically under-served. Three early life role identities emerged to be important in shaping a commitment to teach in a bilingual and under-resourced school: 1) *language broker* 2) *urban poor family member,* and 3) *immigrant advocate.* Andrew projects a self-image of his emerging teacher professional role identity as a social capital broker for urban immigrant students and families who live in poverty.

> *I actually became interested in teaching just recently. I moved back home for a while and started to work for a pre-school. That was the first time I actually became interested in kids in general…most of the kids' parents were like my situation when I was small. The person always going to the conference didn't speak English so the little kid although very small always acted like the adult.*

Role Identity as Language Broker

As a child, Andrew served as a language broker for his family, translating and interpreting between Spanish and English. To broker or mediate on behalf of his family members in various situations required Andrew to have an exceptional understanding of both verbal and written forms of communication in two languages at an early age. Andrew had to make sense of documents and materials that exceeded what would be expected of a child to understand, translate and explain the meanings from one language to another. Verbal communication required Andrew to identify social nuances, cultural norms and symbols, to make sense and interpret meanings accurately. Though the responsibility to mediate complex interactions was great for a child Andrew recognized the benefits of being exposed to various situations through language mediation. Along with developing his language skills and increasing his lexicon in English, Andrew acquired knowledge about different subject areas that he would not otherwise been exposed to given his families' English language skills. He was called on to be able to make meaning of different contexts and use his language skills in different ways. As Andrew mentioned below he was six or seven when he started to help his Grandmother complete forms in English.

Andrew was exposed at an early age to situations that required him as a child, to make a decision an adult would make. Situations that Andrew had to broker necessitated the ability to understand the weight of the problem, potential outcomes and the consequences of his decisions. Language brokering helped Andrew develop advanced problem solving and critical thinking skills. In the first excerpt below Andrew responded in a focus group discussion about the differences between low-income and more affluent

students that demonstrated an understanding of the complexities and life situations of children in poverty. Andrew understood as a child of poverty, he and children similar to him have concerns specific to their day to day that do not concern affluent children. Part of children's daily concerns required Andrew to be involved in complex situations between adults that necessitated quickly making meaning of social situations and nuanced interactions on behalf of his family. Andrew developed a facility to traverse between different cultural and social systems, and mediated important interactions, the consequences of which impacted his family's education, health and well-being. In the following excerpts, Andrew described in detail his own experiences as a language broker.

> *You have to go places to translate for your parents. You have to make decisions that adults make so there's other things going through your head besides, you know, [what] I'm learning in school and what I'm going to do after school. If you're in an area where your parents are struggling to pay bills, and your parents don't speak English, you have other worries. You maybe have to sell candy at school to help out as much as you can.*

> *Well, just based on my childhood…when you translate for people, you don't just translate at the store or at parent-teacher conferences, you also translate for medical doctors, for different stuff like that. There are a lot of subjects that I guess younger kids would not be exposed to when you are translating at a doctor's [office]. Not just that, but always having…I just always remember having [to] help my grandma fill out forms because not*

only did she not speak English, but she didn't know how to write or read. I was about six or seven I think. Once I learned how to write, I would go over to her house. [She would ask me], "Read this for me." Then I had to try to figure out what it means, so I guess in a way it was beneficial.

Andrew understood his role exposed him to circumstances that developed his knowledge about the daily issues that he and his adult family members negotiated. However, serving as a language broker also created insecurity and distress for Andrew. His family's reliance on him to help make major decisions as a child was an unsettling burden. To not have another adult in his life that was an authority figure who could make decisions about adult and family matters made Andrew feel vulnerable as a child. Part of growing up in an immigrant family or a family that speaks a language other than English is learning how to navigate multiple cultural, social and economic systems on one's own. Not having an adult in Andrew's life that was an authority figure who could guide him left him with feelings of uncertainty and vulnerability. In the excerpt below Andrew described how he felt as a child and how he believes he shares similar experiences with the students he teaches.

I didn't really feel secure because she, [my grandmother] was the adult and I was a child, and I was telling her what to do. I didn't realize that had an effect on me until I was older and met people who didn't have to go through that stuff and then I said, "Oh well, that's why I had these feelings when I was younger that maybe other people didn't have."

Students have similar insecurities and difficulties that arise from growing up in one world and going to school in a different world.

As a young child, Andrew experienced the challenges of growing up in the United States in a family whose primary language was Spanish. He often served as a language broker, one who mediated transactions that required an adult authority. Such transactions demanded a facility to understanding nuanced meanings, values, and norms embedded in English and the abilities to assess the intent and potential outcomes of the transactions. Although his role as a language broker provided opportunities at an early age to develop knowledge and experience that would be useful when he became an adult, the experiences also created a sense of uncertainty and unease. The responsibilities and the emotional burden of language brokering as a child gave Andrew experiential knowledge which he draws from when he considers the lives of his students.

Role Identity as Urban Poor Family Member

Andrew grew up in an urban poor family. His experience as an urban child living in poverty exposed him to the realities and difficulties of supporting a household, particularly for immigrant parents whose first language is Spanish. Andrew's parents also had grade school educations and were educated in a different country. Andrew's parents' language and education levels limited their opportunities to hold well-paying jobs. At an early age, Andrew understood the importance and value of money. As discussed above, Andrew served as language broker and was relied upon to mediate complex interactions

for his parents that involved his ability to translate and interpret English and Spanish within various contexts. Andrew understood the concerns of children in poverty, particularly those who come from immigrant families that do not speak English. His understanding about the worldviews of families of poverty is reiterated in the excerpt below, a perspective influenced by his own family's economic instability.

> *"Money is really important for [immigrant parents] because money determines if you eat that day, if your power gets turned off, if your water gets turned off, if you get evicted, so money is really important. So, at least in my household from the time that I was small, my parents viewed the world based on money, this is how much this cost, this is how much that cost. So, at a [young] age, I knew [how to] determine quantity, if I buy a pound of beans, this is how much it is going to cost.*

Activities in which Andrew engaged were determined by the kinds of resources and skills available to his family. Andrew's parents drew on the skills and resources they had. In doing so they employed their children in the family business. Andrew worked to help his family make ends meet by helping his father sell goods at the local open market (swap meet). Andrew learned how to sell merchandise rapidly, in order to turn a profit. Andrew's understanding of the value of money was also reinforced as he learned about the family business. Andrew's father taught him and his brother entrepreneurial skills that included how to price their merchandise for a fair market price. As Andrew would describe, he learned how to price merchandise that was competitive with other sellers at

the market, but would be able to yield the greatest profit. Andrew's father also taught him and his brother how to calculate a profit margin, so that when they bargained with customers they were within a range of prices for which their goods could be sold without losing profit (see excerpt below). Practical life experiences associated with helping the family provided Andrew and his brother opportunities to develop advanced math problem solving skills.

Andrew's understanding of profit and loss gave him a context for developing math skills, and he did so with great facility (see excerpt below). Working at the open market negotiating with clients required Andrew to be able to quickly calculate in his head prices per unit sold. In the case of selling fabric, Andrew had to calculate the price per unit length in yards or meters. The kind of math Andrew had to use also required him to convert the units sold from one system of measurement, metric or English to the other. Similarly as a consumer, to be able to make his family's money stretch as far as he could, Andrew learned how to calculate prices of goods per unit to be able to get the best price per unit good. Andrew described how he learned to calculate the cost of dry beans per unit weight (see first excerpt this section).

> *When I was older, we would help my Dad at the swap meet. We would sell mostly textiles, but [also] anything that my Dad thought he could sell at a swap meet. You learn how to measure, how to do different things, count in your head quickly. First of all, you have to make sure that no one is stealing any merchandize and you have to make sure that you are able to push the customers quickly through… Like buying the stuff that they need*

to in order for you to make more money because you are not the only person that is selling textiles at the swap meet. [We would sit] down with my Dad calculating, "Okay, we paid this much for this. This is how much we are going to sell it for." My Dad would sit down with us and say… he wouldn't necessarily say why we have to sell it, but we kind of figured okay, we need to make profit out of it.

Opportunities to develop math skills as a child in poverty took place in everyday events, beyond the family business. Andrew recalled different ways he became familiar with numbers at an early age. Andrew's family had one car which his father used for work, leaving the rest of the family members to rely on public transportation when Andrew was younger. In order to know which bus to ride, Andrew learned how to identify the bus number associated with the proper bus route. Another example of everyday activities which exposed Andrew at an early age to numbers was learning how to count change with his grandmother. In the excerpts below, Andrew described how his experiences as a child who grew up with little means yield different opportunities to learn math.

When you take the city buses [there are] different things you learn… I mean it sounds dumb, but you learn little stuff when you are really small… like okay, the 3 takes you here. So, you learn the numbers.

I just always remember counting, from the time I was little counting money, having my grandma count change.

Growing up urban poor required Andrew to take on family responsibilities to support the family economics. Andrew's worldviews early on in life were framed through a need to survive financially. The kind of activities and situations that Andrew was involved in were driven by economics. He learned the value and worth of money, and how to budget his and his families' finances either as a consumer or as an entrepreneur. His early life experiences as a member of a low-income poor family created opportunities in which he developed complex problem solving and advance mathematical skills for his age.

Role Identity as an Immigrant Advocate

At an early age, Andrew took on the role of advocate, negotiating for access to learning opportunities around issues of literacy. He developed skills that allowed him to cross cultural and language borders with fluidity. Frequently, Andrew and his brother had to translate and interpret English and Spanish between his parents and their school staff. Andrew continued to serve as an advocate when he successfully advocated for himself and his brother with school administrators to be placed in mainstream math and science courses instead of English Language Learning (ELL) classes. The advocacy skills Andrew developed continued to serve him later in life.

In a past position as a para-professional at a pre-school with a large population of Spanish speaking children and families, Andrew advocated for English language literacy

for one of the ELL children. He drew on his personal experiences and his bilingual skills to identify the child's verbal aptitude. Andrew determined the child appeared to have adequate language skills and abilities based on the child's response to questions posed in Spanish, while the child's English speaking teacher presumed the child to be illiterate. Andrew successfully negotiated between the child's teacher and parents to focus on developing the child's English language skills rather than developing the child's motor reflexes. In another example, Andrew was instrumental in changing teachers' communication practices with pre-school children's parents. He advocated for letters and announcements to be sent home in Spanish and served as a translator and interpreter during parent/teacher conferences. It was Andrew's experience advocating for children and their families as a para-professional that sparked an interest to work with children (see quote above, page 114).

Knowledge Andrew had about his students was grounded in his personal experience as a child who shared similar experiences, but also as a young adult working with ELL children and parents in a pre-school. Andrew's ability to advocate and witness how children and parents benefited from his efforts on their behalf influenced his development in becoming a teacher of under-resourced students and at a school that is predominately made up of students from Spanish speaking homes. Furthermore, the knowledge of the needs surrounding English language acquisition and the value he places on English fluency has impacted the learning opportunities Andrew provides his students in his science classroom. Below is an example of how Andrew's viewed his responsibilities towards bilingual and immigrant students.

I provide the students with resources that may be useful to them. The reason I do this is because this knowledge is crucial for survival in the United States. Since their parents are for the most part unfamiliar with this information, I believe it is my responsibility to provide the students with this information in order to help them improve their lives and the lives of their parents.

As a para-professional, Andrew witnessed interactions between teachers and immigrant students that caused him to consider teaching as a career. Andrew specifically expressed an interest to teach students who are vulnerable to potential harm by teachers who are not well trained to work with diverse students. In one case he recognized a difference in the tone of voice of a teacher of White European decsent when she interacted with students who came from majority white backgrounds compared to those that were of immigrant status. In the expert below Andrew describes how his observations in the classroom as a para-professional revealed differences in how different students were treated. In the excerpt below, Andrew reports how the teacher inappropriately asked a child about the relationship between a police officer's visit to the classroom and the child's parent potential deportation or incarceration when the child displayed trauma and terror at the site of the police officer. Andrew recognized that the teacher overstepped her boundaries and confronted her after school to let her know he did not approve of her behavior and that he was a witness on behalf of the child.

I was a para-educator. I realized there were a lot of differences between

teachers, I guess the way that teachers interact with specific students. That's one of the reasons I [thought] this is something I should do. I started thinking about when I was growing up, looking back and seeing that there were a lot of kids that could have been able to go to college but didn't because they were just tossed aside.

[There was] one instance where this kid was terrified of the police. They had the police officer come into the class. This kid was crying and ran [away]. He was going crazy. She said something to the effect, "Did they take your parents?" I said after class to her, "I don't think that whether his parent had been taken to jail or not or deported was you concern." Because it's not like she's paying for his food or supporting him. So, why does she care? I read up on the policy of the school district and I made her aware that I knew the rules.

As an immigrant child Andrew experienced having to transition and learn a new culture, values and norms. He had to also communicate his understandings to his parents and many times took the identity of the authority of a new culture. While he worked as a para-educator, Andrew's childhood experiences as an immigrant became more transparent as he witnessed students' and their parents' experiences mirror his own biographical history.

Emerging Teacher Professional Role Identity: Social Capital Broker

Andrew's emerging teacher professional role of identity was influenced by his early role identities as a child of an urban poor immigrant Spanish speaking family. Experiences as an advocate, language broker, and member of a low-income family allowed Andrew to position himself as a social other in solidarity with his students and their families who share similar demographic backgrounds. His early role as a language broker guides the kinds of activities he believes are necessary for his students to be successful in school and American society. For example, activities Andrew includes in his curriculum provide various opportunities for students to practice their written and verbal English skills. The reason for providing different opportunities to practice English is the belief that if students and their families are to be successful and survive in American society, students need to gain a facility in both written and verbal English skills. Andrew's own experience as a language broker and advocate for immigrant English language learners underlies his commitment to work with bilingual under-served students and their families, as indicated in the excerpt below. It is his belief as a teacher who grew up in the United States as an immigrant Spanish speaker, that it is his responsibility to help those who he believes to share similar experiences.

> *Well, since I had gone through a lot of similar experiences, and seeing I guess the way the system kind of works, I had this desire to help other students who might be going through similar experiences. So, one of the things that I always had to do in my class was offer like a lot of writing and speaking opportunities to help with English. I have lot of students that are*

ESL or classified as [English Second Language learner]….So that's one of the reasons why I wanted to work at, I guess, primarily bilingual schools. There are a lot of students whose second language is English.

Andrew is socially positioned within the school network where he is able to connect with students in specific ways that allowed him to address the nuanced needs of low-income immigrant Spanish speaking families. Andrew was able to inquire into the lives of his students that got to specifics about their life situations. Insights to the roles and responsibilities students hold are also based on Andrew's own personal experiences and roles of identity as an advocate for immigrant students and families. In an effort to help his students' families, Andrew inculcates his students with information about procedures, methods, and rules regarding civic responsibilities and acquiring property wealth. Andrew recognizes again much of the responsibilities that are mainly of adult matters fall on the shoulders of immigrant children because of an immigrant parent's child's connection to social and cultural knowledge through school networks. In addition, children develop English language skills that equip them as authority over their parents. As a teacher of immigrant students, Andrew continues to play the role of advocate and mediator, however he does so as part of his professional identity as teacher.

I have students who ask me questions about tax forms, about everything, and it is just simple information that they can probably obtain online, but their parents don't know how to do any of this. Their parents have this problem at home, and they [the students] go out and try to figure out what

to do. That's [the] stuff that I always used to do mainly because my dad was working all the time.

Most of the students at the school that I teach at are first generation immigrants and their parents are still learning about the United States and its rules. I provide the students with resources that may be useful to them. In addition, I try to talk about the importance of financial planning and go over processes like purchasing a home. The reason I do this is because this knowledge is crucial for survival in the United States. Since their parents are for the most part unfamiliar with this information, I believe it is my responsibility to provide the students with this information in order to help them improve their lives and the lives of their parents.

Andrew articulated teaching practices that were transforming the relationships he was building with his students and families. Andrew learned as a child the processes and practices that resulted in inequitable opportunities both in and out of school. His choice to teach at a bilingual and urban school was intentional. He viewed himself as a mediator and advocate for those who are less likely to benefit from the social and economic structures within students must operate and exist. However, Andrew leveraged his position as a teacher to create equitable learning opportunities. Recognition and respect for students and their families is grounded in a perspective of social justice. Andrew began the work of creating a more equitable learning environment for his students because he was able to recognize and identify potential points of entry where he was able

to get to know and understand his students. In the excerpt below, Andrew described one way he tries to get to know his students through an activity that brings to the foreground the life experiences of his students.

> *Oh, yeah, with the students, I mean… one of the activities that I do at the beginning of the year and then we get a lot of new students as I kind of make them stand in a line and then tell them move forward if your parents can help you with biology homework, move back if your parents didn't finish high school, that kind of stuff, so then… by then the class you see that most of the students' parents didn't go to high school or completed elementary school. So, that's obviously a big problem because if you have homework in class and you are taking it home and we are asking the students to do all these things and then they really have no one to help at home.*

Andrew's heightened awareness of the struggles of an immigrant family had sensitized him to pay attention to the difference between the lives of his students and his own experiences. As a result of the slowed US economy and immigration status of many of Andrew's students and their families, Andrew came to realize his students' lives as being even more unstable and complex then his early childhood experiences. He recognized his students shoulder greater responsibilities than he did as a child and they must learn along with their parents to navigate complex socio-economic systems.

I helped at the swap meet, but I didn't actually have a separate job and have to give [my parents] money. But, I found out a lot of my students, I would say at least 25% in each class, actually have a job to help their parents, especially now with the economy that number has gone up. Some parents don't have documentation. So when they get laid off, they don't qualify for unemployment or any other benefits…creates a whole different area that I didn't really experience and I wasn't aware of.

Even though the students may not exhibit ambition in their academics there is that ambition to survive and to move forward economically. I see that on a regular basis, students have more than one job, doing everything they can do to help their families.

Andrew was committed to teaching students who have been traditionally under-served, particularly students and their families who come from low-income/poor backgrounds and are immigrant students who are primarily Spanish speakers. His ability to empathize with his students' experiences and challenges directed how he sees his role to aid and support his students' academic and personal development and everyday existence.

DISCUSSION

Andrew called on early life experiences and events as he reflected about his interests to teach science in an under-resourced and bilingual school. His biographical experiences informed his early role identities as 1) *language broker* 2) *urban poor family member* and an 3) *immigrant advocate.* Andrew's bridging identities align with Galindo's (1996) study of two Latina teachers. Galindo identified the teachers' professional role identities connected by bridging identities as ethnic minority students, Spanish monolingual speakers or language minorities in schools, and members of poor families (Galindo, 1996). Andrew's bridging identities projected a self-image that revealed an emerging teacher professional role identity as a social capital broker for urban immigrant students and families who live in poverty.

Andrew's emerging teacher professional role identity included a moral obligation to assist his students and their families beyond formal schooling and included the informal knowledge of negotiating cultural, social, and institutional structures. As a practicing teacher, Andrew articulated a responsibility to provide his students who are urban, immigrant poor and who speak primarily Spanish at home, with resources needed to survive in the United States. Like him, Andrew's students had experiences as urban immigrant poor, Spanish speakers. Andrew empathized with the early roles his students took on. Responsibilities of keeping one or more jobs to help with the family finances was part of Andrew's repertoire of early self-images as an urban poor family member working to help his family. These self-images provided Andrew with insights into the

day-to-day lives of his students outside of school the insights helped Andrew make sense of his students' behavior in class (Gomez et al, 2008; Monzo & Rueda, 200).

Andrew viewed his students to be ambitious and courageous in their pursuit to maintain financial stability for their families. He viewed his students as those who have agency to influence their own lives and are relied on as productive and valuable members of the family was a perspective that recognized students' capacity as holders of social capital. Andrew's own experiences as a child working to assist his family's business, a language broker, and an advocate created unique opportunities to develop complex problem solving skills. As a child, the ability to negotiate the intricacies of adult interactions within culturally nuanced situations provided Andrew with knowledge and understanding of his students. Andrew's respect and appreciation for his students' capacities are values he has ascribed to his emerging professional teacher role identity.

Andrew's experience shaped his commitment to becoming a science teacher in a bilingual and under-resourced school. Andrew's early bridging role identities as an advocate sensitized him to the complexities and life realities of his students, which influenced his emerging professional role identity as teacher. Andrew's shared past biographical experiences that formed a connection with him and his students as children who came from urban poor and monolingual Spanish speaking families. Andrew took on early identities that shaped his future career choice and how he chose to interact and provide opportunities both in formal and informal educational settings. Andrew saw his emerging professional role as one of a broker of social capital. To live this role meant choosing to teach in a place where students can most benefit from his early biographical experiences and knowledge.

CONCLUSIONS

This study highlights one Latino pre-service teacher's early role identities or bridging identities as 1) l*anguage broker* 2) *urban poor family member,* and 3) *immigrant advocate.* Andrew's emerging teacher professional role identity as a social capital broker for students at a poor urban and bilingual school was shaped by his early role identities. Andrew's early role identities or bridging identities are perceived by him as being similar to his students. Shared experiences around poverty, language, and immigrant status provided the impetus for Andrew to choose to teach in an under-resourced and bilingual school. Andrew believed he can leverage his position as a teacher to provide opportunities beyond the formal curriculum that help his students and their families persist in a new country, one that requires knowledge and skill to negotiate complex social, cultural, and linguistic interactions. As a Latino science teacher, Andrew had knowledge about the complexities of his Latino students' lives and also a recognized and respected students' persistence and cultural, linguistic, and familial resources. Andrew positioned himself as a social capital broker and in doing so revealed a commitment to socially just and humanistic pedagogy for poor, urban and immigrant students.

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CHAPTER 5: SUMMARY

In sum, the three previous chapters outline what is at the core of a particular group of prospective teachers that underlie their commitment to teach in under-resourced schools and districts. Prospective teachers committed to teaching in under-resourced schools have qualities or attributes of *recognition* and *respect* for students and families who come from different backgrounds and experiences. These prospective teachers were able to recognize complex interactions that students and their families face at the individual, social and institutional level. They also sought ways to address their students' learning needs by drawing from students' experiences to make meaningful connections between home and school. To identify students' and families' lived experiences, cultural practices, and language as resources to draw from, are acts of *recognition* and *respect* towards students and their families who are, for many Scholars, different from themselves. *Recognition* and *respect* for difference are essential attributes that underlie a socially just and humanistic pedagogy which can positively impact the learning outcomes for students who are historically poorly served by our public schools. This work highlights a different view that prospective teachers from majority White European backgrounds have about social others. It also provides a new framework using social otherness as a lens to reveal prospective teachers' understandings and knowledge about students and families from low-income backgrounds.

Prospective teachers in this study also demonstrated attributes of recognition, an act of acknowledgement that affirms and validates the different experiences, interests and perspectives of social others compared to the accepted norms of the majority dominate culture (Giroux & McLaren, 1986; North, 2006). Social others experience the world

around them differently as a result of established social and institutional structures. To foreground social others' experiences as different, one can interrogate the structures that uphold the majority experience and the accepted norms, values, and rules that lead to inequitable learning outcomes (Cochran-Smith, 2008; Valenzuela, 1999). Recognition is also a socially constructed endeavor in which the other's identity is positively or negatively formed (Jenlick & Townes, 2009). In the absence of recognition, the social others' experience is silenced (Kozol, 1991; Soloranzo & Bernal, 2001; Villegas & Lucas, 2002). Such was the case with Lana. She recognized her social position as a teacher, as part of the established institution. Lana is monolingual, White European, and middle class. This created a power difference that disparaged her relationships with her students' parents and the school. The prospective teachers in this study, for the most part, are likely to begin the work of creating a more equitable learning environment for their diverse students because they are able to recognize and identify potential unjust interactions and issues at the individual, social and institutional level.

Respect for difference was another attribute apparent in prospective teachers' emerging practices. The teachers articulated their teaching practices as transforming the relationships they were building with their students and families. Lana's ability to problematize her social position in relationship to her students and parents allowed her to seek ways to overcome potential obstacles to build positive relationships. She repositioned herself as one who is an extension of her students' families that permitted a relationship built on trust and respect. Similarly, Dana's acknowledgement of her students' linguistic resources prompted her to reposition herself as a monolingual English speaker in order to develop a new language skill. Her use of English and Spanish in the

classroom demonstrated Dana's sincere efforts to reciprocate her students' efforts to communicate using all their language resources. Andrew leveraged his position as teacher to mediate information, knowledge, skills and rules to students' and their families' who would otherwise have limited societal and financial access. Andrew positioned himself as a social broker for his students. The respect that the teachers had for students and families who may have had different experiences than themselves was an entry point for their development of deeper understanding for their students and families, practices for social justice.

The study highlights prospective teachers' nuanced understandings about diverse others that contrast with a deficit perspective documented in the literature (Dusek, 1985; Ford, 1996; Irvine, 2003; Valenzuela, 2005). Studies that have shown that prospective teachers who come from diverse backgrounds express a deeper commitment towards diverse students than those who come from predominately White European middle class backgrounds (Montecinos, 1994). However, this study reveals that prospective science and math teachers clearly express deep commitments to teach in under-resourced school districts regardless of their socio-economic or cultural background. A decision to teach in schools and districts is grounded in a commitment to address the inequitable distribution of resources, specifically the distribution of quality math and science teachers in hard to staff schools and districts. Prospective teachers' commitments are also grounded in the teachers' recognition and respect for differences. The prospective teachers in this study have attributes that mark successful practicing teachers of diverse students. Prospective teachers who have had positive experiences with social others also demonstrate characteristics of teachers who are successful teaching diverse students (Nieto, 2005).

These characteristics include the ability to recognize issues of poverty, cultural and linguistic diversity that focus on unequal distribution of social, and unequal distribution of political and institutional resources. It is the ability to recognize these issues that lead to the reproduction of educational outcomes for all students and thus, social order (Luke, 2010; Luykx & Lee, 2007).

IMPLICATIONS

The findings of this study suggest that recruitment efforts to attract high quality science and mathematics teachers into low socioeconomic schools and districts should not discount teachers who want to teach science and mathematics and help children learn, even if the recruits do not come from similar situations themselves. In this respect, recruitment efforts that focus too narrowly on attracting under-represented minorities to science and mathematics teaching may be discounting a group of potentially interested teachers. Prospective teachers can understand and meet the learning needs of low socioeconomic status students even though they are not from socio-culturally diverse backgrounds themselves. For example, life experiences through work or church in communities characterized as low socioeconomic status may be associated with interest in teaching in low income or poor school districts. For many teachers, the desire to help others learn is the primary reason to teach. Creating opportunities for science and math majors to tutor students or to work with adolescents from under-served populations may appeal to STEM majors' desire to help others, a potential teacher recruitment activity. Such opportunities may provide the appeal necessary for these STEM majors to consider teaching careers.

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