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Pre-College Sources of Influence for Traditionally Underrepresented Students Attending College: A Social Network Analysis Approach

Abstract

This study examined a variety of sources of influence for traditionally underrepresented students at a primarily White institution of higher education. The sources of influence ranged from 2-way communications in high school to 2-way communications in the community, and from 1-way communication influences in the school such as AP courses, to 1-way communication influences outside of the school such as social media. The data were collected via an online survey distributed to first time in college freshmen in the College of Natural Sciences at the University of Texas at Austin. The survey results were analyzed using ANOVA and social network analysis (SNA). While SNA has been used in education, it has not been used in the college access discourse. Given the connection between social capital and college access, and the use of SNA to examine social capital, using SNA to examine social capital provided an interesting way to explore the influences for students in college access. The researcher hypothesized that people, in and out of school, would be more influential to traditionally underrepresented students than their traditionally represented counterparts. While some of the findings supported the hypothesis, there were significant findings in financial aid and social media platforms for traditionally underrepresented students, offering leverage points for high school, higher education, and policy makers.

Document Type

Dissertation

Degree Name

Ph.D.

Department

Educational Administration and Policy Studies

First Advisor

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Keywords

College access, Community cultural wealth, Funds of knowledge, Social network analysis, Social resource theory

Subject Categories

Educational Administration and Supervision | Educational Leadership

Publication Statement

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Pre-College Sources of Influence for Traditionally Underrepresented Students
Attending College: A Social Network Analysis Approach

A Dissertation

Presented to

the Faculty of the Morgridge College of Education

University of Denver

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Rebekah G. Kester

June 2017

Advisor: Kristina Hesbol

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Degree Date: June 2017

ABSTRACT

This study examined a variety of sources of influence for traditionally underrepresented students at a primarily White institution of higher education. The sources of influence ranged from 2-way communications in high school to 2-way communications in the community, and from 1-way communication influences in the school such as AP courses, to 1-way communication influences outside of the school such as social media. The data were collected via an online survey distributed to first time in college freshmen in the College of Natural Sciences at the University of Texas at Austin. The survey results were analyzed using ANOVA and social network analysis (SNA). While SNA has been used in education, it has not been used in the college access discourse. Given the connection between social capital and college access, and the use of SNA to examine social capital, using SNA to examine social capital provided an interesting way to explore the influences for students in college access. The researcher hypothesized that people, in and out of school, would be more influential to traditionally underrepresented students than their traditionally represented counterparts. While some of the findings supported the hypothesis, there were significant findings in financial aid and social media platforms for traditionally underrepresented students, offering leverage points for high school, higher education, and policy makers.

ACKNOWLEDGEMENTS

This dissertation is dedicated to my husband, Gabe, and my daughters, Annie, Sarah, and Josie. They shared their wife and mom for this pursuit, and it is as much their doctorate as mine. I love you all more than you could ever possibly know. I also want to dedicate this to my grandad, Harry Talley, who was a professor and unknowingly introduced me to the amazing, crazy world of academia.

First and foremost, I want to thank my parents, Bill and Sue Guthrie, and my brother, Drew Guthrie, who were supportive the whole time, even before I knew I was going to start this journey. My mom and dad put in many hours cheering me on and watching grandkids so I could go write papers. You all have been the constants in my life and provided guidance and support in ways you'll never know.

Dr. Kristina Hesbol, thank you for serving as my dissertation chair, and most importantly, thank you for caring about me and my educational pursuits. Thank you to my committee members, Dr. Susan Korach, Dr. Ellen Miller-Brown, and Dr. Nicole Nicotera. I respect each of you immensely and am honored that this accomplishment has your seal of approval. Furthermore, this dissertation would not have been possible without the kick start from my former supervisor, Sue Harkins. Thank you also for the support of David Vanden Bout, and all of my The University of Texas at Austin people. What we do here really does change the world.

Finally, I would not be the person I am today without my amazing ELPS cohort. The amount of learning and growing I did with all of you can never match what is contained in books. Thank you from the bottom of my heart.

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CHAPTER ONE: INTRODUCTION

Education as a means for social mobility (e.g. to move out of poverty) has been a subject of discussion and research in sociology since the 1950s. In order to train future workforces for the increasing technical jobs, access to higher education has also been discussed as a necessary step in the upward social mobility (Boudon, 1974; Brown, Reay, & Vincent, 2013; Carey, 2004; Goldthorpe, 2013). Indeed, the lifetime economic benefits attributed to a college education are documented and continue to grow. In 2004 the median income for men age 25 years and older who earned no more than a high school diploma was \$31,624, while the median income for the same demographic with a bachelor's degree was \$51,876, 64% higher than a high school diploma alone (U.S. Census Bureau, 2001).

The job market in the United States is also changing. The increase in demands in the workforce from an industrialized nation to a technologically-focused nation (Casserly, 2012) necessitate a change in the way students are educated. Increased academic achievement and job preparation are critical. According to a recent Forbes report two of the skills employers look for most in employees are critical thinking and complex problem solving (Casserly, 2012; Wagner, 2014). While high school begins to foster these two skills, students do not often gain these valuable abilities until during the college years (Conley, 2007). Furthermore, according to census projections, within 20 years, the U.S. will be approaching majority-minority status, and by 2050, members of

minority groups are projected to become the majority population (U.S. Census Bureau, 2001).

Because of the disparity in income and opportunities between those with bachelor's degrees and those without, access to higher education has become a social justice issue (Brennan, & Naidoo, 2008). Depressed numbers of Black, Latin@¹, and first generation students in college are often attributed to a lack of equity in such systems as high school structure (Wald & Losen, 2003), limited access to financial aid (Duan-Barnett & Mabry, 2012), and internalizing stereotypes perpetuated in the media (Allen, 1985; Fry, 2011; Strayhorn & Terrell, 2010).

Yet the world is more connected than ever through technology. Smartphones, television, and the internet all provide opportunities to connect with friends and strangers, near and far. The current class of college freshmen, born primarily in 1999, are part of the Millennial Generation which has been shaped by technology (The Council of Economic Advisers, 2014). Millennials are also the largest, most diverse generation in the US population (The Council of Economic Advisers, 2014).

Yosso (2005) and Gonzalez, Moll, & Amanti (2005) have turned the conversation around diversity in education to an asset-based perspective. Yosso developed her Community Cultural Wealth model (Yosso, 2005) which took Bourdieu's (1977) social capital model and integrated Critical Race Theory (Crenshaw, 1991) to create an asset-based model of what Latin@ students bring to life. Gonzalez, Moll, and Amanti (2005) also argued students bring Funds of Knowledge with them and that these funds are assets to be used in life. These funds are crucial in an educational setting for both the Latin@

¹ The use of @ at the end of Latin@ denotes both Latina and Latino.

student as well as the other students in the classroom: if everyone has the same type of capital from the beginning, there is no room for growth, no friction for which to spark change, fewer opportunities for complex problem solving, and no varying viewpoints to create opportunities for critical thinking (Williams, Berger, & McClendon, 2005). Thus, it becomes important to increase diversity in higher education.

Furthermore, Lin (1990) developed her Social Resource Theory which looked at resources as goods, both material and symbolic, that can be accessed and used in social situations and can be classified into two categories: personal resources and social resources. This theory capitalized on a person's characteristics such as gender, race, age, education, networks, and family as resources that can be used as currency in society. Viewing a student's background and life as currency dramatically increases the need to look through a Community Cultural Wealth and Funds of Knowledge lens to learn what currency traditionally underrepresented students have in their networks and leverage that for college access. This study looked at what those sources of currency are, and how valuable they are to students who attend college.

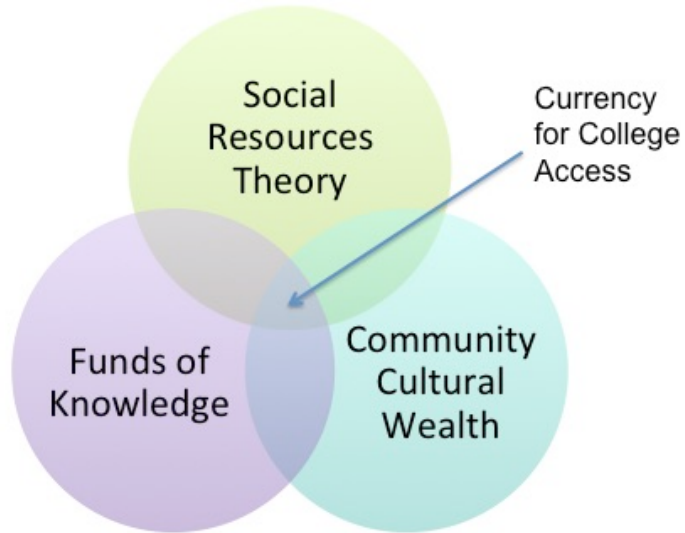


Figure 1. Study’s conceptual framework

Access to higher education is a big business. Policy makers have enacted laws around increasing access to higher education which opened the way for whole organizations, from SAT test preparation companies, such as the Princeton Review, to access programs such as GEAR UP (Higher Education Act of 1965, 2010), with the intent of providing opportunities for traditionally underrepresented students to access higher education. In Texas, lawmakers created a plan entitled Access and Equity 2000 (Texas Higher Education Coordinating Board, n.d., p. 2) as a response to litigation that ruled using race in the admissions process violated the Fourteenth Amendment. The Access and Equity 2000 plan, among other things, created a path for a more diverse population in Texas to access higher education by automatically admitting the top ten percent of each public high school’s graduating class to any state university the student desired (Educational Commission of the States, 2009a). Evidence suggests the policy has been effective in maintaining some level of racial and ethnic diversity in admissions (Niu & Tienda, 2010). Nationally, the federal government has tried to increase access to

college through the creation of Pell Grants, US Department of Education loans, and a focus on college readiness in the No Child Left Behind Act (Federal Student Aid, 2014; US Department of Education, 2014). However, despite the focus on college access and college readiness, a gap persists in the United States between high socioeconomic status (SES) families and low SES families, White students and students of color, those who have family members who attended college and those who are first-generation college students (Education Commission of the States, 2009). These statistics create an imperative for finding leverage points for creating access to college for traditionally underrepresented students.

Statement of Problem

While the rate of attendance for first generation students remains significantly lower than that of students whose parent(s) attended college (Wirt et al., 2004), those who do attend college are seen as barrier breakers as they overcome obstacles to reach higher education. Many studies have looked at the influence of teachers, parents, peers, and guidance counselors on students attending college (Conley, 2007; Crosnoe & Needham, 2004; Hooker & Brand, 2010; Noddings, 1993; Ream & Palardy, 2008; Ream & Rumberger, 2008; Valdez, 1993; Wegmann & Bowen, 2010), yet few have looked at influential people outside of a student's immediate circle. Other researchers have looked at the influence of music on teenager's lives (North, Hargreaves, & O'Neill, 2000; Schreiber, 1988) and still others have looked at the influence of social media (Valenzuela, Park, & Kee, 2009). However, none have looked at the effect of these everyday factors all within one survey, nor have they examined them in relation to a student's decision to attend college and as a way to break through the barriers.

Research Question

Despite the research on the importance of access to higher education and the undeniable positive impact of a college-going culture in K-12 schools, there are many students who do not attend a high school with a college-going culture, yet they go on to higher education. Researchers have looked at several sources of influence including, though not always targeting, this traditionally underrepresented population for closer examination.

In order to increase the knowledge base around how traditionally underrepresented students find a path to the University of Texas at Austin, specifically the College of Natural Sciences, this addressed the following research question: What are the pre-college-going sources of influence for historically underrepresented students who attend the College of Natural Sciences at the University of Texas at Austin? In order to answer this question, three sub research questions are asked:

1. What are the frequencies, averages, types, and categories of sources of influence for students based on race, socioeconomic status, college-going culture in high school, and parent education level?
2. What might social network mappings of these sources of influence look like and how might they relate to Community Cultural Wealth, Social Resources, and Funds of Knowledge models?
3. How do the different measures of size and density vary through different populations in the data set?

Significance of Study

Different studies have examined the effects of various actors on a student's decision to attend college, while some studies have examined the effect of influences in a student's environment, such as music and the internet. The entering class of freshmen have grown up in a digital age where they have not known life without the internet. This shift in paradigm is bound to also change how students navigate their lives, including their road to college.

Students whose parent or parents have attended college are significantly more likely to attend and graduate from college themselves. That fact added to the national average birth rate of 1.87 children per woman (Central Intelligence Agency, 2015), by finding the leverage points to get more first-generation students into and through college, the greater the rate to break the poverty cycle of which minority and low SES students are the majority.

This study provided a missing piece in the understanding of how traditionally underrepresented students matriculate to college. This study also informs the field of higher education (i.e. college readiness and transitioning to college) by examining sources of influence from the family and classroom level, all the way through the policy level. These sources of influence can also help inform college personnel on the most effective ways to support students through the many transitions in college.

Definition of Terms

The following section provides definitions of terms which are used throughout this study:

- *Capital* – The collection of resources that people within community systems have and use to navigate their interactions within the community system (Naidoo, 2004).
- *First Generation College Student* - Students designated the first in their families to pursue higher education (McElroy, Armesto & American Federation of Teachers, 1998).
- *Flagship University* – A state’s largest and most selective public college (CollegeBoard, 2014).
- *Funds of Knowledge* – Based on the premise that “people are competent, they have knowledge, and their life experiences have given them that knowledge” (Gonzalez, Moll, & Amanti, 2005).
- *Latin@* - “Persons of Spanish-speaking origin or descent who designate themselves as Mexican American, Chicano, Puerto Rican, Cuban, or of some other Hispanic Origin” (Campos et al., 2009, p. 158). Use of the @ at the end denotes both the feminine Latina and the masculine Latino (Demby, 2013).
- *Predominantly White Institution (PWI)* - An institution which excluded Black and or other students from enrolling in its institution before the Civil Rights Acts of 1965 (U.S. Commission on Civil Rights, 2010), though which enrolls traditionally underrepresented minorities now.
- *Traditionally Underrepresented Students* – Populations of students who have been historically underrepresented in higher education based on race, ethnicity, and class (e.g. Black, Latino, low socio-economic, or first-generation college students) (Smith J. L., 2014).

CHAPTER TWO: LITERATURE REVIEW

The need for higher education is increasing. Employers are looking for skills which college helps provide (Casserly, 2012; Wagner, 2014), the annual income difference between high school graduates and baccalaureate graduates is growing (National Center for Educational Statistics, n.d.), and in a globalized world a more diverse way of thinking is necessary (Casserly, 2012; Wagner, 2014). Indeed, enrolling in college and completing a degree provide many long-term benefits including increase career opportunities and social upward mobility (Contreras, 2011), there are also potential societal benefits such as reducing the burden on social service agencies (Baum & Payea, 2005), decreasing the school-to-prison pipeline (Pane & Rocco, 2014; Wald & Losen, 2003), and producing a more educated society that is prepared for democratic citizenship (Katsinas & Bush, 2006). However, in the United States, access to higher education is not as easy for traditionally underserved populations (Harper, Patton, & Wooden, 2009). Those who face some of the greatest barriers often include students from low-income families, first generation college students, and students of color (Contreras, 2011). Related to the historically low college enrollment rates for these subgroups is the relationship between income status, race, ethnicity, and secondary academic preparation (Katsinas & Bush, 2006). Large differences remain in the achievement test scores

between traditionally underrepresented and privileged students (ACT, 2009; Contreras, 2011; Katsinas & Bush, 2006).

Despite the fact that high school students' college aspirations have been on the rise, significant gaps remain in college readiness, access, and success across race, ethnicity, and income groups (Roderick, Nagaoka, & Coca, 2009). Katsinas and Bush (2006) contend that urban youth have especially suffered the consequences of educational environments that do not provide individualized attention or create a college-going culture within the school, and this has the effect of negative post-secondary outcomes.

This chapter now will focus on college access, specifically for traditionally underrepresented students. A survey of the literature in promoting a college-going culture in high school, Funds of Knowledge (Gonzalez, Moll, & Amanti, 2005), how systems and organizational designs affect college access, and finally some possible sources of influence for promoting college access.

Promoting a College-Going Culture

Promoting college is especially important for first-generation students, as well as students traditionally under-represented on college campuses (Roderick, Nagaoka, & Coca, 2009). Despite the emphasis in recent years on the importance of attending college and the overall increase in student academic attainment expectations (Domina, Conley, & Farkas, 2011), there are still large differences in both college attendance among different groups of students. Students who come from families with higher incomes are more likely to attend college than students who come from low income families, and White and Asian-American students are more likely than Black or Latin@ students to attend college (Roderick, Nagaoka, & Coca, 2009). The problems related to unequal rates of college

access have led many researchers to make recommendations for high schools, in order to improve college-going culture for students. These best practices generally include increasing academic preparation, fostering college aspirations and expectations, as well as assisting students and families with key steps needed for college entry (Nagaoka, et al., 2013; Tierney, Bailey, Constantine, Finkelstein, & Hurd, 2009).

Helping students develop higher academic expectations is another way schools can help students become more college-ready. School climate, which is significantly shaped by educators, can play a large part in developing a college-going culture. Researchers who examined a variety of factors that were related to college attendance found that a strong college-going culture in high school was a strong predictor of college enrollment (Nagaoka, et al., 2013; Roderick, Nagaoka, Coca, & Moeller, 2008). This college-going culture was fostered by relationships with teachers, coaches, administrators, and counselors, and appeared to benefit students with the lowest academic qualifications most. In fact, developing relationships with students is one of the most important ways that elementary and secondary educators can help promote a college-going climate (Noddings, 1993). Duncan-Andrade (2009) suggested that educators give students “critical hope” for the future by providing them with a feeling of empowerment through offering resources, making sacrifices, and showing solidarity with students. Encouraging students by helping them develop their own academic self-efficacy, an individual’s conviction that he can achieve at a specific level in an academic arena (Bandura, 1997), requires a personal relationship with students. Another theorist who argues in favor of a caring relationship with students is Noddings (1993). She argues that

students can succeed if educators are willing to provide what she calls the “ethic of care” (1993) in order to educate the whole child.

Schools are not the only places students can receive encouragement and encounter a college-going climate. Yosso (2005) developed her Community Cultural Wealth model, which looked at the intersection of Bourdieu’s (1977) social capital model and Critical Race Theory (Crenshaw, 1991), to create an asset-based model of what students bring to life. Within this model are six forms of capital: navigational capital, aspirational capital, familial capital, linguistic capital, resistance capital and social capital. These six capitals offer insights into other influencing factors in a student’s life, influences that could help propel the student to college.

Capitals

In order to better understand current theories, this section begins by building on the traditional notion of capital. In 1933, Marx defined capital as having two elements: surplus value and investment (Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011). To Marx, capital is the *surplus value* from productively investing resources, or what businesses today call profit (Lin, 1999). Along those lines, and through a human frame, Bourdieu and Passeron (1977) introduced the notion of social capital where capital is both the investment (e.g., relationships with teachers) and the profit from that investment (e.g., better grades). Capital, then, is the collection of resources that people within a system of social roles have and use to navigate those positions. This can include everything from family relations, language ability, personality type, connectedness to others, perseverance, knowledge, or skills. According to Bourdieu (1977), capital is what is valued by those in power within the social position. Subsequent definitions of social

capital list it as an asset or a resource, embedded in social relationships, which can be used to improve one's life outcomes (Coleman, 1988; Lin, 2001; Portes, 1998). The relationships themselves do not constitute social capital, but when the relationships are used as currency they become valuable and can then be used as that social capital (Coleman, 1988).

Bourdieu's view was later challenged by Yosso (2005) who contended that there are many types of cultural capital; it is only because of systems of hierarchy and inequity that some types of capital are valued differently, some higher than others. Bourdieu (1992) described college as a kind of community system of social positions that generates its own values and behavioral norms; college is centered in a hierarchy where there are dominant and subordinate identities, values, and positions. This hierarchical system is still alive today; in many ways, historically underrepresented students struggle to succeed in colleges that do not know how to value the culture that those students already hold (Wood, Forbes, Gould, & Greenbaum, 2009).

Restructuring College-Valued Capital

In a manner that mirrors Bourdieu's viewpoint, college-going programs are often designed in a deficit manner, viewing and valuing historically underrepresented students in the same way the systems that suppress them (Naidoo, 2004). Through this deficit viewpoint, students are considered to be lacking the capital needed to succeed in college.

However, scholars building on Bourdieu's theories argue that in order to achieve true equity, colleges need to strive to be restructured socially, politically, and economically in order to no longer be a hierarchal field from the start (Yosso, 2005). In other words, students would be valued equally for the various types of capital they

already have, instead of having to reproduce the capital valued by the dominant culture. The rewarding of “status culture participation” (rather than just those who are already members of the dominant culture) continues to privilege the hierarchy of one type of knowledge sharing through what is deemed “formal” education (DiMaggio & Mohr, 1985). Thus, it becomes important to nurture a variety of cultural capital within students instead of teaching them to acculturate to the dominant society.

Bourdieu continues his theory by adding that depending on an individual’s experience, identity, and upbringing, a student will develop or not develop a college-going “habitus” (Bourdieu, 1977), or a disposition for persisting into postsecondary education (Naidoo, 2004). This habitus becomes a form of capital in itself, as something valued by the educational field and privileging those students for access into higher education. The largest gap in applying Bourdieu’s (1977) model in education to improve educational outcomes (Stanton-Salazar and Dornbusch, 1995) is the failure to take a traditionally underrepresented student’s networks into account for how capital is made and used (Allard, 2005; Pérez and McDonough, 2008; Rios-Aguilar and Deil-Amen, 2011; Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011).

Funds of Knowledge

The term ‘funds,’ originally surfaced in Wolf’s (1966) work, refers to how knowledge is used as a form or currency and bartered through social networks. The concept of communities having “funds of knowledge” was first introduced by two anthropologists, Vélez-Ibañez and Greenberg (1992) while they were observing working-class Mexican families in the southwestern United States. They studied how, despite the uncertainty of their jobs and living situations and despite being marginalized, families

used their social networks to mediate their uncertainty and disadvantage (Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011). Since then, educational researchers used the theoretical framework of funds of knowledge to show the students and families of underrepresented students have knowledge and competence because of their lived experiences, as well as provide a counter narrative for the variation in Latin@ students' academic and non-academic outcomes (Gonzalez, Moll, & Amanti, 2005; Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011). Though funds of knowledge originated with the study of Latinas, the theory has been used and influenced the study of different groups of underrepresented students, including Mexican-Americans (Ayers et al., 2001), Puerto Ricans (Olmedo, 1997; Rios-Aguilar, 2010), Haitians (Conant et al., 2001), and Blacks (Foster and Peele, 2001).

To make the existing research on Funds of Knowledge stronger, children must also be studied to see how their social networks are created and survive independent of the adults in their lives (Moll 2005; Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011). Instead of utilizing traditional conceptions of social capital, Rios-Aguilar et al. (2012) employ a social network approach to social capital to understand the decision-making processes and educational trajectories of underrepresented students through and beyond college. Such an approach captures the intersection of dynamics between individuals and the larger social and institutional structures within which they are embedded (Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011).

Educational Systems through a Social Justice Lens

Public schools in the United States are plagued by vast inequalities which are frequently defined along lines of race and class (Wald & Losen, 2003). High-poverty, high-minority schools routinely receive few resources (Kozol, 2012), fewer qualified

teachers (Darling-Hammond & Post, 2000), and fewer college preparatory or advanced level courses than their White peers (Brennan, 2002). In fact, Duan-Barnett (2013) argues that the choices students make are rooted in the context within which they live, from their family through the federal government, and the range of opportunities afforded them, so students in high-poverty, high-minority schools systematically have more limited choices.

These systemic inequities permeate all aspects of college preparation and college access. Bourdieu's (1977) concepts of cultural capital and social stratification fields help frame how colleges are built to mediate and reproduce social inequity, where some students are allowed in and others kept out. Understanding the structure of college through Bourdieu's theories can then allow traditionally underrepresented students to navigate it in a way that has previously hindered them from entering. The educational pipeline, historically and today, continues to ensure and maintain inequity by admitting and favoring students based on historically valued assets (Carter, 2009; Naidoo, 2004). To understand these disparities, there is significant interest and investigation into the role of students' backgrounds and academic characteristics; however, it must be clear that these types of investigations will only provide a partial understanding (Cabrera & La Nasa, 2000; Choy, Horn, Nunez, & Chen, 2000; Freeman, 1997; Greene & Forster, 2003; Perna, 2000; Venezia et al., 2003). The social stratification in college preparation, enrollment, and success is integrally related to the degree to which students receive support and guidance for college planning (Cabrera & La Nasa, 2000; González, Stoner, & Jovel, 2003).

The very structure of schools creates impediments to college. Students typically attend school with students of their same race and ethnicity, showing the large segregation within school districts (Bankston and Caldas, 1998; Choi, Raley, Muller, Riegle-Crumb, 2008; Portes and Hao, 2004; Reardon, Yun, and Eitle, 2000). Coupled with research that shows students with higher levels of interaction and exposure to students with college-educated parents are more likely to attend college (Choi, Raley, Muller, Riegle-Crumb, 2008), have access to college preparatory and advanced placement classes (Gamoran, 1987; Kanno & Kangas, 2014), and increased social networks to post-secondary options (Duan-Barnett, 2013), the current system for public school is setting traditionally underrepresented students up for failure. Researchers have also found that higher educated parents are more knowledgeable about the educational system, including post-secondary requirements, and may be therefore more likely to demand more challenging courses for their children than less educated parents (Andre-Bechely, 2013; Baker and Stevenson, 1986; Useem, 1992).

School size is also a contributing factor in social networks. Large high schools offer the most opportunities for students to benefit from school-based social capital because those schools are often organized around bureaucracy, hierarchy, and formal relationships (Lee & Croninger, 1999; Lee, Smerdon, Alfred-Liro, & Brown, 2000). The Coleman Report (Coleman, 1966) set up this stream of research by finding that the socioeconomic status of schoolmates influences academic achievement. More recent studies show that the socioeconomic composition of schools is related to achievement, aspirations, and attainment (Walkey, McClure, Meyer, & Weir, 2013). Pitre (2006), while comparing aspirations of Black students to White students, found that post-

secondary aspirations are comparable, but Black students who perceived their high schools were not preparing them adequately for college were less likely to attend college.

Sources of influence

Given that there are so many obstacles for students of color, first generation students, and low-income students to navigate, how is it that students from these demographic groups make it to college? This section explores sources of strength and influence that traditionally underrepresented students may use to gain access to post-secondary education. The areas are separated into categories (see Table 1), based on the type of interaction the student could have with the source of influence (i.e., a two-way communication with the influence, or a more one-sided communication with the influence where the student initiates all interaction with no individualized reciprocation) and where the communication takes place (i.e., within the high school or out in the community).

Table 1

Types and sources of influence

		<u>Location</u>	
		School	Family & Community
<u>Type of Communication</u>	2-way communication	<ul style="list-style-type: none"> • College Prep Programs • High School Peers • Teacher (same race) • Teacher (general) • Teacher (favorite) • Teacher (least favorite) • High school principal • High school coach • High school counselor 	<ul style="list-style-type: none"> • Facebook friends/groups • Community organizations • Spiritual advisor • Mother/maternal figure • Father/paternal figure • Another family member • Sibling(s) • Camp at a university
	1-way communication	<ul style="list-style-type: none"> • High school courses • College visits to high school 	<ul style="list-style-type: none"> • Campus Visits • College sports on TV • Facebook newsfeed • Internet • Television • Music • Twitter • Snapchat • Other social media • Financial Aid • Top 10% Law

High School. One major source of influence for high school students is through social networks within the school. Perna & Titus (2005) conducted research that showed regardless of a student’s social, economic, cultural, or human capital, the likelihood of enrolling in post-secondary education is related to the number and kind of social networks accessed at the school they attend. Research shows that traditionally underrepresented students rely heavily on their high schools to support and prepare them for post-secondary education (Adelman, 2006; Farmer-Hinton & Holland, 2008; McDonough, 2004; Venezia & Kirst, 2003; Wimberly, 2002), often with mixed results (Farmer-Hinton & Holland, 2008). High school students spend roughly 40% of their

weekdays in school (US Bureau of Labor Statistics, 2014), providing great opportunities for interacting with a college-going environment. The following describes some of the ways high school students could find influence within the high school environment.

Reciprocating interactions. One group with mixed results for influencing college access is high school counselors. Wimberly (2002) conducted focus groups with Latin@ and Black high school students who were planning to attend college. The students reported that teachers and high school guidance counselors were the most influential in their college planning, second to only their parents. The students reported these adults were instrumental in encouragement and help in getting into college. Gonzalez et al. (2003) found that students in four year universities reported higher access to and involvement with their high school counselors, and Farmer-Hinton and Adams (2006) found that in smaller high schools, students of color reported close relationships with counselors that facilitated access to college. However, students in rural areas or large high schools have reported lack of access to counselors (Ceja, 2000; Corwin, Venegas, Oliverez, & Colyar, 2004; Lee, 1987; McDonough, 2005) or the counselor's bias as a deterrent to college (Bryan, Holcomb-McCoy, Moore-Thomas, & Day-Vines, 2009).

Another influential source for students are teachers and coaches. As the school personnel with daily contact with students, teachers and coaches can affect a positive relationship with the student and be a source of influence (Engberg & Wolniak, 2010). Researchers examined teachers, in particular, and found teachers to be agents of social capital (Gonzalez, Stoner, & Jovel, 2003). Some research has suggested that teachers and mentors of the same race are more influential and/or more preferential to the mentees/students (Bryant & Zimmerman, 2003) based on Ogbu's (1990) similarity attraction

paradigm which states that mentors and mentees from a similar ethnic background are most likely to have successful mentor-mentee relationships. However, other research suggests cross-race relationships can be just as beneficial (Flaxman, 1992; Maxwell & Connell, 2013; Rhodes, 2002). Given the differing research this study will differentiate between teachers of the same race and those of differing race from the student.

Administrators can also play a large role in providing students access to college. Theoharis (2009) examined social justice leadership by drawing on the experiences of successful school principals. One of the keys he discovered was "...advance inclusion, access, and opportunity for all" (p. 1). Though not always in direct and/or sustained contact with students, Stone & Clark (2001) suggest principals and assistant principals have great influence by the policies and priorities they implement in the school.

College preparation programs, also known as early intervention programs and pre-collegiate outreach programs (Perna & Titus, 2005), are an increasingly common approach to provide avenues of access to college for traditionally underrepresented students. Federal programs such as the Federal TRIO programs have been around since the 1960s. In the late 1990s, GEAR-UP (Gaining Early Awareness and Readiness through Undergraduate Preparation) started (National Council for Community and Education Partnerships, n.d.) as an attempt to educate students about and prepare them for postsecondary education. There are also state programs, non-profits, and college-sponsored programs such as Advancement Via Individual Determination (AVID), CollegeForward, and Quest Bridge (Barnett, Fay, Bork, & Trimble, 2013; Fenske, Geranios, Keller, & Moore, 1997). These efforts are aimed at both creating a college-going culture and teaching the skills necessary to gain access to and succeed in college.

Research has shown that peers have a strong influence on each other, though research on post-secondary plans and college going are mixed (Alexander & Campbell, 1964; Chen, 1997). In addition, research shows that, especially for low-income and minority students, peer groups alter school outcomes (Gibson, Gándara, & Koyama, 2005; Kindermann, 1993; Perna & Titus, 2005; Ryan, 2000; Tierney & Coylar, 2005). Even when controlling for socioeconomic, familial, and academic ability variables, Sokatch (2006) found that peers normalizing attending college is the single best predictor of 4-year college attendance. This suggests that friends' wishes and plans are the single most important predictors of 4-year college enrollment for low-income urban and minority high school students (Sokatch, 2006). Cerezo, Lyda, Beristianos, Enriquez, & Connor (2013) found peers to be one of the leading positive factors in Latin@'s educational journeys.

Non-reciprocating interactions. Many high schools offer dual credit, concurrent enrollment, and AP (Advanced Placement) courses. While research shows that secondary schools serving primarily underrepresented students typically do not offer these courses, research shows that they provide some influence in attending college (Bailey & Karp, 2003; Johnston & Barbour, 2013; Swail & Perna, 2002).

Participation in extracurricular activities, such as on sports teams, high school clubs, or organizations, has shown a positive influence on a student's desire to proceed to post-secondary education by promoting non-cognitive skills (Borghans, Ter Weel, and Weinberg, 2014; Cunha, Heckman, & Schennach, 2010; Kuhn & Weinberger, 2005). Troutman and Dufur (2007) found that females who participate in sports are more likely to excel academically and complete college than their non-athlete counterparts. They

also found that the positive effects of sports participation are greater for females than for males (Troutman & Dufur, 2007) although some research shows athletes are less prepared for college than their non-athlete counterparts (Hwang, Feltz, Kietzmann & Diemer, 2013).

Athletics is not alone in co-curricular or extracurricular education in high school. Many students participate in other activities such as chess club, yearbook, or theater. Lleras (2008) showed these activities to be no less important for predicting educational attainment when compared to test scores. However, students from upper-middle-class families are far more likely to join school clubs and sports than their working-class peers (Marsh and Kleitman, 2002) despite colleges highly valuing these extracurricular activities as a way to measure a student's diversity of interest (Snellman, Silva, Frederick, & Putnam, 2015).

Community. While high school students spend a large part of their day in an educational setting, their community still plays a large role in their college ambitions. Some of the factors that could influence, or dissuade, students from post-secondary aspirations will be discussed in the following section.

Reciprocating interactions. Parental involvement in gaining access to postsecondary education is well documented. Parental involvement in college preparation programs is key to its success (Swail & Perna, 2000; Tierney, 2002). In order to successfully involve parents, organizations must recognize the cultural and education strengths as well as the barriers of migrant families (López et al., 2001). Parental involvement also leads to higher grades (Lee, 1993; Martinez, Cortez, & Saenz, 2013; Muller, 1993; Zick, Bryant, & Österbacka, 2001), a greater likelihood of attending

college (Cabrera & La Nasa, 2000; Horn, 1998; Hossler, Braxton & Cooper-smith, 1989; Hossler, Schmit & Vesper, 1999; Martinez, Cortez, & Saenz, 2013; Perna, 2000), and lower likelihood of behavioral problems or high school truancy (Lee, 1993; McNeal, 1999; Nhlapo, 2014; Zick, Bryant, & Österbacka, 2001). The possible weakness in studies around parental involvement, however, lies in the fact that parental involvement is usually one indicator and not a multidimensional construct as suggested by many researchers (Perna & Titus, 2005; Sui-Chu & Willms, 1996). In their qualitative study of four school districts with large migrant populations, López and colleagues (2001) found that before parents could participate in their child's education in a meaningful way, their social, economic, and physical needs had to be addressed (De Carvalho, 2014).

Siblings can also play an important part in college access. Cooper, Jackson, Azmitia, Lopez, & Dunbar (1995) found that in many Latin@ families, older siblings acted as teachers, and even advocated on behalf of their younger siblings to join them at college. Having older siblings establish a college-going culture in the house is also vital to paving the way to college by exposing parents to a college-going culture, as well as teaching valuable skills in navigating college choice (Carolan-Silva & Reyes, 2013; Ceja, 2000). In some ways, the older sibling acted as a mediator to the barrier of being a first-generation student. Ceja (2006) also found that older siblings were important in helping younger siblings think about their potential college careers.

While no literature was found linking spirituality to college access, the literature surrounding the importance of religion and spirituality in the lives of Blacks and Latin@s (Chatters, Taylor, Bullard, & Jackson, 2009; Taylor & Chatters, 2010) suggests spiritual leaders could be a source of influence in the lives of students which has not been tested or

measured yet. Another community source that was surveyed is community organizations which often serve the purpose of mentoring youth. Organizations such as Big Brothers Big Sisters have shown promise in overcoming delinquency and propelling students to post-secondary education (Bradach & Grindle, 2014; Jekielek, Moore, Hair, & Scarupa, 2002; Maxwell & Connell, 2013).

While the internet in general could be impactful, certain programs which use the internet could also prove to be influential in promoting college access, especially for traditionally underrepresented students. Wohn, Ellison, Khan, Fewins-Bliss, & Gray (2013) found that Facebook friends were related to students' confidence about college-knowledge. First-generation students demonstrated higher self-efficacy about the college application process when they found information about college through social media. While the divide between Black and White digital users continues to persist, 22% of Black internet users use Twitter, a social media platform, compared to only 16% of White internet users (Smith, A., 2014). Blacks and Whites are also just as likely to own a smartphone which provides internet access (Smith, A., 2014). No research could be found looking at the connection of social media of any form to college access, though with the previous statistics, the possibility seems to exist.

Non-reciprocating interactions. Higher education itself can also have a strong influence on students' postsecondary educational aims. Intense loyalty to a team, organization, or school can influence actions (Adler & Adler, 1988; Clayton, 2013). And despite the friction between athletic departments and the educational side of the university, the appeal of the athletic teams is an undisputed university recruitment tool (Davis, Nagle, Richards, & Awokoya, 2013; Sperber, 1990).

Colleges and universities often invite schools for campus visits. Exposure and proximity to college campuses has been shown to create college-going cultures in schools and in students, whether it is through summer camps (Engle, 2007), career days or college fairs (Swail & Perna, 2002), or just living near a college campus, as it becomes part of your daily exposure (Frenette, 2004; Turley, 2009).

For the current generation of Millennials, a majority who has never known a world without computers or the internet, the impact of technology and popular culture is large (The Council of Economic Advisers, 2014). Although household use of computers and the internet continues to expand, a digital divide still exists (Madigan and Goodfellow, 2005). While research exists on increased internet usage (U.S. Department of Commerce, 2000) and the correlation between internet usage and educational attainment (Madigan and Goodfellow, 2005), little to no research looks directly at the effect of the internet on college access.

Social media outlets such as Facebook, Instagram, and Twitter use algorithms to target marketing (Wotkyns, 2014). Often these algorithms access internet search data or key words used. If students search for college, athletic teams, or anything that triggers the algorithm to suggest higher education, the news feeds could trigger a form of college access (Wotkyns, 2014). Television could also have an impact on college access. Television has been shown to be influential in teenagers' lives from alcohol consumption (Grenard, Dent, & Stacy, 2013) to social concepts of virginity and sexual behavior (Kelly, 2010; Moyer-Guse & Nabi, 2011), so like the influence of college athletics, exposure to colleges through televised sports, advertisements, and news programming could increase exposure to a college culture in the student's life.

Like television researchers have examined the influence of music on teenagers' lives (North, Hargreaves, & O'Neill, 2000; Schreiber, 1988), no one has looked at the effect music or musical artists could have on college access. In an effort to be comprehensive about aspects that touch students' lives, music should be included.

Finally, policy has long played a role in education in the United States. In 1967 the U.S. created the original Department of Education to collect information on schools (U.S. Department of Education, 2012). Since then, the federal government has continued to pass legislation in the area of education. Likewise, states have passed their own legislation affecting education. Two major areas of policy are likely to be well enough known to high school students that the policies could have had some effect on their path to college.

In 1994 a plan entitled *Access and Equity 2000* was put in place. The Access and Equity plan was challenged by the *Hopwood, et al. v. State of Texas, et al.* (1996) case, ruling that stated the University of Texas at Austin Law School had "violated the equal protection clause of the Fourteenth Amendment when it utilized racial preferences in deciding which applicants would be admitted to the law school" (Texas Higher Education Coordinating Board, n.d., p. 2). Evidence suggests the policy has been effective maintaining some level of racial and ethnic diversity in admissions (Niu & Tienda, 2010).

The other policies about which students at the University of Texas at Austin would be aware surround the availability of financial aid. In 1986, the U.S. Congress created the Advisory Committee on Student Financial Assistance (ACSFA), under the reauthorization of Higher Education Act (HEA), to provide counsel on student financial aid policy (Advisory Committee on Student Financial Aid, 2001). The Higher Education

Act identifies the range of federal student aid programs including the Pell grant, work study, and the loan programs (Duan-Barnett, 2013).

Theoretical Model

Developing a theoretical model to accurately represent college access for traditionally underrepresented students provides a robust opportunity to view college access through an asset-based lens. Researchers have used Critical Race Theory (CRT) to address race in the context of predominantly White institutions (PWIs) such as The University of Texas at Austin (Harper, Patton, & Wooden, 2009; Teranishi, Behringer, Grey, & Parker, 2009). However, CRT was not specifically developed with first generation students in mind. And while Yosso's Community Cultural Wealth (2007) framework addresses how traditionally marginalized groups pull from their own strengths in different forms of capital, this research focused more on the individual's interactions with people, places, and things, even outside of his or her community. For that reason, this study integrated components of both Yosso's (2005) Community Cultural Wealth Theory and Lin's (1990) Social Resources Theory as its conceptual framework.

CHAPTER THREE: METHODOLOGY

As the call for a more socially equitable education system continues (Duncan-Andrade, 2009; Shields, 2013), which at least in part allows for more equitable access to higher education (Roderick, Nagaoka, & Coca, 2009), it is important to look at some of the sources of influence of those who attend post-secondary education. This chapter introduces the hypothesis, purpose of the study, the research question, the research design, the study sample, the procedures and instruments for data collection, and the data analysis.

Purpose of the Study

The overarching purpose of this study was to understand the sources of influence for students who attend college at the University of Texas at Austin, a four-year, full-time, more selective, public institution with very high research activity, that is also a primarily White institution (PWI) (Carnegie Foundation, n.d.). Throughout the study, the research examined how first-time freshmen remembered their high school years as they relate to gaining access to higher education. Experiments were differentiated between those who came from traditionally underrepresented populations and majority minority high schools, and compared their sources of influence to the rest of the University of Texas at Austin student population. Hopefully, this research offers insight into how to

better support traditionally underrepresented students at all levels: classroom, school, community, family, higher education, and policy.

Research Question

The students surveyed in this study were first-time freshmen at The University of Texas at Austin in the College of Natural Sciences. The majority of Traditionally Underrepresented Students (TUS) are enrolled in one of three colleges (Natural Sciences, Liberal Arts, and Undergraduate Studies), and this study aimed to examine the sources of influence for TUS. In order to increase knowledge pertaining to how TUS found the path to higher education, this study attempted to answer the following question: What are the pre-college-going sources of influence for historically underrepresented students who attend the College of Natural Sciences at the University of Texas at Austin? In order to answer that question, three sub research questions were asked:

1. What are the frequencies, averages, types, and categories of sources of influence for students based on race, socioeconomic status, college-going culture in high school, and parent education level?
2. What might social network mappings of these sources of influence look like and how might they relate to Community Cultural Wealth, Social Resources, and Funds of Knowledge models?
3. How do the different measures of size and density vary through different populations in the data set?

Hypothesis

Based on the literature review above, I hypothesized that the type and nature of the interaction (i.e., reciprocating vs. non-reciprocating, and school vs.

family/community) would be determining factors in how influential that source is. I believed reciprocating interactions would surface as more influential than non-reciprocating interactions. Based on that hypothesis, this study used social network analysis as well as some more traditional statistical methods to examine the differences in types of influence.

Methodology

This study used a single case study design, bounded by looking at The University of Texas at Austin's college of Natural Sciences first time in college freshmen (figure 2). This method was chosen in part because of the desire to look specifically at The University of Texas at Austin's College of Natural Sciences instead of generalizing beyond the university (Stake, 1995). While less common, this study used the purely quantitative analysis tools of ANOVA and SNA, to look at the size, density, and strength of influence networks for high school students preparing for their entrance into higher education (Yin, 2011).

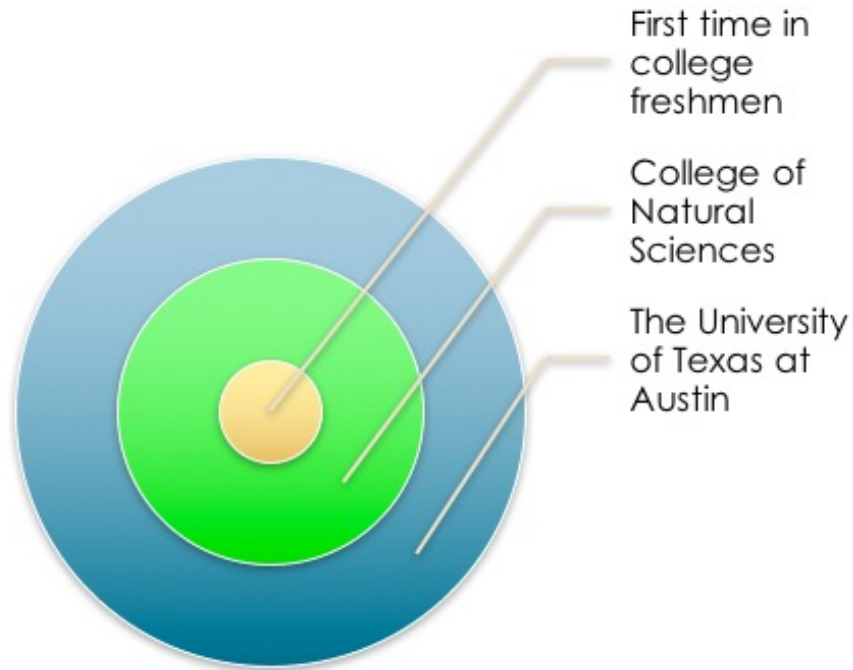


Figure 2: Bounded case study design

Research Design

This study used social network analysis to examine sources of influence for each student surveyed. Social network analysis (SNA) has been used to examine social capital, social networking sites, and diffusion theory (Carolan, 2014). While SNA has been used in education, it has not been used in the college access discourse. Given the connection between social capital and college access, and the historic use of SNA to examine social capital, this method provided an innovative way to explore the influences for students in college access.

The concept of SNA was reportedly developed in the early part of the 20th century by John C. Almack, a Stanford University professor (Freeman, 1996), but much of the more contemporary available literature (Blatner, 2006; Freeman, 2000; Hoffman, 2001; Scott, 1988; Thompson, 2006) credits Moreno with the development of sociometry,

the methods used to assess connections between people. Moreno developed the sociogram in the 1930s as a method of diagramming social connections using representative nodes and links, or points and lines. The method known today as social network analysis, however, was created by Barnes in the 1950s to describe the social interactions in a village. Barnes developed the term to describe the process and analysis of those interactions without first-hand observation of each individual exchange.

SNA is a hybrid of qualitative and quantitative methodology, giving a quantitative way to look at subjective, non-independent data. Social network analysis is similar to concept mapping in that SNA involves connections between individuals and groups and the visual representation of those connections (Lanzing, 2004; Novak & Canas, 2007). Examining college-going influences with SNA is a way to look at many influences at once and identify patterns and gaps. A social network is a set of actors and the relations that hold those actors together. Actors can be individuals, organizations, or families. Actors form social networks by exchanging one or many resources, physical or non-tangible, with each other, modeling Lin's Social Resource Theory (1990). Such resources can include information, goods, services, social support, or financial support (Emirbayer, 1997). Social actors are 'nodes' in the network and the ties between the nodes are called 'links,' linking actors together by social ties. Some common examples of ties include friendship, school relationships, social media connections, talking together, and family. In addition to the type and content of the relationship, interactional criteria are used to evaluate social relationships in networks, and include the frequency of communication between actors; whether ties are reciprocal between actors or one directional. The strength of their ties (Carolan, 2014; Daly, 2010; Marsden & Campbell, 1984) may range

from weak to strong. Social position refers to the place where an individual is located within the social network—the distance the individual is from the resources or capitals (Granovetter, 1973; Friedkin & Thomas, 1997; Lin, 1999; Rios-Aguilar & Deil-Amen, 2012; Thomas, 2000). With whom the student forms these connections and the nature of these connections can play a large role in the student’s ability to access different types of capital.

Social network analysis is a method with which to map the real, often simultaneous, interpersonal relationships and interactions among a set of social actors, and then analyzing how structural regularities influence the behavior of the actors (Borgatti, Everett, Johnson, 2013; Bott, 1971; Leinhardt, 1977; Wellman & Berkowitz, 1988). SNAs are a diagnostic tool for:

- 1) promoting effective collaboration within a strategically important group;
- 2) supporting critical junctures in networks that cross functional, hierarchical, or geographic boundaries; and
- 3) ensuring integration within groups following strategic restructuring initiatives (Cross, Borgatti, & Parker, 2002).

Within this study, SNA was used to examine the strength of influence between actors and examined if certain connections and groups of connections were stronger (i.e., more influential) for traditionally underrepresented students than for traditional college students. Since I hypothesized that connections that are relational in nature will have a greater influence than those which are not relational in nature, SNA was selected as the method that could help parse that distinction.

The scope of this study was purposefully narrowed to the College of Natural Sciences in the University of Texas at Austin, a public, four-year higher education institution that satisfies the criteria for qualifying as a PWI. As a flagship institution,

administrators across the nation and state look to The University of Texas at Austin to set an example of how to reach institutional goals, such as increasing diversity, graduation, and retention rates. Flagship universities seek to attract the highest quality faculty, students, and “compete on behalf of the state in the national marketplace of public research universities” to blaze a trail for quality in higher education (Lombardi, 2003, p. 1; Smith, 2014).

The survey development emerged from an extensive literature review around possible sources of influence for marginalized communities within higher education. Areas of interest to include in the survey were also created using a conceptual frame vetted by two faculty experts in the field to get their input. Dr. Judy Kiyama is an associate professor at the University of Denver and has done extensive research in the field of Funds of Knowledge, and Dr. Pedro Reyes, former Associate Vice Chancellor for Academic Planning and Assessment for the University of Texas System. Dr. Reyes’ research focuses on conditions fostering high academic success for children in poverty and the learning differences for students of color. Since this is exploratory research, I recognized there was no way to completely account for all options. However, using the above-mentioned resources, I believe the resulting survey provided a sound basis to know if further research is warranted, or if sources of influence are similar for all college students, regardless of their differences.

Social network analysis is also a natural fit for the theoretical model. All three theories, Community Cultural Wealth, Funds of Knowledge, and Social Resource Theory, are based on connections between people and the value of those connections. SNA provides the vehicle to map and measure those connections. Additionally, SNA is

inherently asset-based in the way it looks for connections instead of deficits which is a key component of all three theories.

Description of the Research Site

This study used the first-time freshman population in the College of Natural Sciences at the University of Texas at Austin, a four-year, full-time, more selective, public higher education institution with very high research activity (Carnegie Foundation for the Advancement of Teaching, n.d.). The University of Texas at Austin had a student population of 50,950 in the fall of 2015, with 39,619 undergraduates (Brown, 2015). The University of Texas at Austin is the state's flagship university and is seen as a national leader in higher education.

The university made national headlines recently in its continuing desire to increase diversity. In 2014, the United States 5th Circuit Court ruled in favor of The University of Texas at Austin in the use of race as one of the admissions factors (*Fisher v. University of Texas at Austin*, 2014). The graduate school was desegregated in 1955 after *Sweatt v. Painter* (1950), followed several years later by undergraduate education in 1956 (Goldstone, 2006). The state fell under national scrutiny several times over the next five decades, starting with *Adams v. Richardson* (1973), in which the National Association for the Advancement of Colored People (NAACP) asserted that the U.S. Department of Health, Education, and Welfare (HEW) had failed to implement Title VI of the Civil Rights Act of 1964 (National Archives, n.d.). In 1973, Texas was found to be in noncompliance with Title VI of the Civil Rights Act of 1964 (US Department of Justice, 2014) which prompted Texas to respond (Texas Higher Education Coordinating Board, n.d.).

The legal and cultural history of The University of Texas at Austin demonstrates why the university continues to be a PWI. Despite being a PWI, the previous president of The University of Texas at Austin, William Powers, as well as the current president of The University of Texas at Austin and former Provost, Greg Fenves, have demonstrated a strong commitment to diversity, notably creating the Division of Diversity and Community Engagement (DDCE) in 2006 with an annual budget of \$30.4 million in 2011 (The Princeton Review, 2011). President Powers charged Dr. Gregory Vincent to lead DDCE and focus on five main areas: campus diversity and strategic initiatives, student diversity initiatives, academic diversity initiatives, community engagement, and university and community partnerships (Impact Report, 2011). Through these five areas, The University of Texas at Austin is working to address systemic problems, including the recruitment and retention of traditionally underrepresented students.

Description of the Sample

The sample for this study consisted of first-time freshmen at the University of Texas at Austin in the College of Natural Sciences (The University of Texas at CNS). It is important to note two things:

- Some of the students surveyed were classified as sophomores or even juniors because of the number of credits they transferred in. However, these students were still included in this study because they never attended a college between the time they graduated from high school and started attending The University of Texas at Austin.

- Some students start The University of Texas at Austin in the spring instead of the fall. These students were not included in the survey to control for differentiating factors between fall and spring start students.

Procedure for Data Collection

Prior to beginning data collection, I received a waiver from the Internal Review Board (IRB) at the University of Denver since I did not intend to generalize beyond the College of Natural Sciences at The University of Texas at Austin. The University of Texas at Austin informed me that because I am not acting as a The University of Texas at employee, student, or faculty member, they do not require IRB approval (see Appendix C). Their requirement is a letter of cooperation from the participating department. I secured the letter of cooperation from Dr. David A. Vanden Bout, Associate Dean for Undergraduate Studies in the College of Natural Sciences (see Appendix D). After obtaining IRB approval, I worked with the University of Texas at CNS Student Division to gain a list of e-mail addresses for all first-time freshmen, defined as those with a First Semester Enrolled (FSE) date of 20169 (year 2016, semester 9 or fall), and a high school graduation date of 20162 (year 2016, semester 2 or spring).

Data Analysis

The sources of data for the study included:

- Survey results from the incoming freshman class, the Class of 2020, who started in fall 2016, at The University of Texas at Austin in the College of Natural Sciences.
- Public information from The University of Texas at Austin's Institutional Reporting, Research, and Information Systems (IRRIS) department website.

- Public information from the Texas Higher Education Coordinating Board (THECB) and Texas Education Agency (TEA) websites.

The survey included a Likert-type scale of -3 to +3, including a Not Applicable option, for students to rate how influential the specific items were in their decision to enroll in college. The data were collected and entered into SPSS to be analyzed.

Analysis of data consisted of social network analysis methods such as finding the degree (the number of ties to and from an ego) and the strength (using the mean of values for a particular influencer).

Once loaded into the spreadsheet, I cleaned the data. For any missing values, I made sure there was no errant value in the cell that could skew the data. I also used the answer a student gave for their high school (HS) to code the student's answer as:

1. HS serves a majority of historically underrepresented students.
2. HS does not serve a majority of historically underrepresented students.

These codes were defined by TEA and THECB's data on high schools. These codes helped give context and compare the sources of influence between the two groups.

The University of Texas at Austin College of Natural Sciences anticipated a 2016 freshman class of 2,400 students, and matriculated 2,394². In order to improve response rates, I included text in the e-mail to the students aimed at increasing their trust, their interest level, and perceived importance, value, and legitimacy about the survey.

Basic descriptive statistics were computed using SPSS, and for the social network analysis I used UCINET 6 for Windows (Borgatti, Everett, & Freeman, 2002) to compute

² The University of Texas at Austin measures class size by the number of students enrolled on the 12th class day of the fall semester, not number of students admitted to The University of Texas at Austin.

data visualizations, tie strength of relationships, type of relationship, and produce network maps.

Summary

The existing literature supports the many possible influences students could have in their decision to go to college and the use of Social Network Analysis to examine those influences. However, there is little to no research which examines many different influences at once, nor is there research that examines many of the more current influences for the Millennial Generation. It is critical for research to evolve as the student population evolves, as generations change. This study drew on some of the various sources of influence for the current generation of college students: high school, family and community, peers, higher education, pop culture, and policy.

This research adds to the existing literature of issues of access and opportunity to higher education at the home, school, higher education, and policy levels. This study also identifies possible future studies, and provides insight into best practices when preparing and recruiting traditionally underrepresented students for college.

CHAPTER FOUR: RESULTS

This chapter presents the analysis of descriptive statistics and a social network analysis conducted to investigate sources of influence of traditionally underrepresented college students compared to their peers who come from a more traditional, strong college-going culture. First, a brief summary of the study is provided.

A set of 2,394 University of Texas at Austin (The University of Texas at) was extracted from The University of Texas at records that met the following criteria: 1) students needed to be first time in college (FTIC) and 2) students needed to have started in the College of Natural Sciences (CNS) in the fall of 2016. The data were obtained with permission and support from the CNS Associate Dean for Undergraduate Education. Results for the analysis include detailed frequencies of student sources of influence, ANOVA results across various demographics, social network mappings of the sources of influence, and quantitative results based in social network analysis. The following questions guided the analysis:

1. What are the frequencies, averages, types, and categories of sources of influence for students based on race, socioeconomic status, college-going culture in high school, and parent education level?
2. What might social network mappings of these sources of influence look like and how might they relate to Community Cultural Wealth, Social Resources, and Funds of Knowledge models?

3. How do the different measures of size and density vary through different populations in the data set?

To answer the first question frequency tables for student demographics and averages for types of influence are provided. The second and third questions are answered using egocentric networks of student influences and the subsequent network analysis. Egocentric networks focus on the actor, the student in this case, and look at the network branching from the actor. First, general maps of the whole network, individual sources of influence, and sources of influence grouped by reciprocating vs. non-reciprocating, and school vs. family/community are presented. Additionally, network mappings, quantitative social network results are presented including measure of size and density.

Response Rates

The Associate Dean for Undergraduate Education sent the link for the Qualtrics survey out to all undergraduate students via his weekly e-mail which netted 78 responses, 39 of which were first year students 16 were second year students, 12 third year, and 11 fourth year. A follow up e-mail to only CNS first year students was sent out a week later and netted 197 more responses. Of the completed surveys five participants declined to take the survey and 37 blank surveys were removed, which left 194 ($n = 194$) useable responses from FTIC first year students, giving a response rate of 8.1%.

Response rates matter because of non-response bias (Fincham, 2008). In this study, there is a non-response bias of nearly 92% which suggests many voices were not being represented in the results of the survey. Compounding the non-response rate for college students is survey fatigue (Porter, Whitcomb & Weitzer, 2004; Adams &

Umbach, 2011). College students, including those at the University of Texas at Austin, are bombarded with surveys about everything from high-risk drinking, to teaching evaluations, to peer research projects. Notwithstanding this fatigue, the researcher used the following methods to increase the response rate:

- Sent the survey multiple ways: via Associate Dean and via direct e-mail from Qualtrics (Pell Institute, n.d.; Survey Monkey, n.d.)
- Followed up with participants with one week reminder (Pell Institute, n.d.; Survey Monkey, n.d.)
- Used attention grabber: used Associate Dean's name to raise importance in first e-mail, and used meme to catch students' attention in follow up e-mail (Pell Institute, n.d.)
- Made participation easy with link to survey embedded in e-mails and kept survey short (Pell Institute, n.d.)
- Personalized follow up e-mail with each student's first name in the salutation (Pell Institute, 2017; Survey Monkey n.d.)
- Ensured anonymity and confidentiality (Pell Institute, n.d.)
- Made survey relevant to students by explaining what it was and how it would be used (Pell Institute, n.d.)

However, despite all measures taken short of incentivizing the survey the response rate was only 8.1%. Because the demographics of the respondents mirrors CNS demographics, and because the information will only be used at The University of Texas at Austin in the College of Natural Sciences and will not be generalized, the responses still give good information that can be actionable despite the low response rate.

Data collection and preparation

All responses were downloaded from Qualtrics and loaded into SPSS. High school name, city, and state were merged with Texas Education Agency (TEA) records. Additional statistics were entered into the dataset: Title 1 funding to use as a measure for overall school SES (Texas Higher Education Coordinating Board, 2016), ethnicity and gender stats as a measure for traditionally underrepresented population (Texas Education Agency, 2016B), TEA name and code to ensure consistency when merging records across data sources (Texas Education Agency, 2016B), and graduation/higher education statistics for each high school (Texas Higher Education Coordinating Board, 2016). The higher education statistics included graduates in both 2-year and 4-year institutions, number of graduates who weren't traceable through the Texas Higher Education Coordinating Board (THECB), graduates not found in higher education, and the total number of high school graduates. These numbers provided the basis for the variable "percent in higher education" which was used as a measure of having a college-going culture at the school. Each student was coded into each of the four designations according to the following definitions:

- Race: Black or African American, Latin@, Native Hawaiian or Other Pacific Islander, and American Indian or Alaska Native were designated as traditionally underrepresented. White and Asian were not.
- Percent of high school graduates entering higher education: The state-identified percent of high school graduates entering higher education the fall after they graduated was 56.23% for fall 2016 (Texas Higher Education Coordinating

Board, 2016), so any high school with the total percent of graduates in HE below 56.23% was considered a non-college-going campus.

- Socioeconomic status: Title I status for the entire campus designated the campus as low SES, which was used as a proxy for student-level low SES.
- First generation status: If neither parent finished a 4-year degree or a professional/graduate degree, then the student was marked as first generation.

Next, the data were also loaded into UCINET 6 for Windows (Borgatti, Everett, & Freeman, 2002) in the form of node lists, one row per student, which UCINET then converted to matrices in the course of running statistical analyses. Before running statistical analyses, the researcher conducted many visualizations through UCINET's NetDraw software to confirm that the visualizations and preliminary results made sense. The researcher looked for appropriate amounts of connectedness between egos (students) and nodes (sources of influence) consistent with the data loaded. After several preliminary analyses, the researcher commenced to running analyses.

Data Analysis

The first research question is answered looking at frequency tables from the data collected. The frequency tables presented in this section include frequencies by students' gender, race, first generation status, college-going culture in high school, and high school Title I status.

Table 2 shows gender. At the University of Texas at Austin, there is a growing movement for non-binary gender classifications so the survey allowed for options other than male and female. The other options were "Non-binary/third gender," "Prefer to self-describe" which allowed for a text entry, and "Prefer not to say." There was a higher rate

of female participation than male, but that is not atypical for surveys, though no causal link has been determined, only correlational (Smith, 2008).

Table 2

Respondents by gender (n = 194)

Variable	n	%
Female	115	59.3
Male	75	38.7
Prefer not to say	1	0.5
Prefer to self-describe	2	1.0
No answer	1	0.5
Total	194	

The College of Natural Sciences at The University of Texas at Austin has the highest rates of diversity at the university for undergraduate education which made it an ideal sample for this research. Table 3 shows the race distribution for participants. The table also includes the College of Natural Sciences overall distribution for FTIC as a comparison of representative sampling. There is a discrepancy between the Apply Texas application, which all applicants to Texas public higher education institutions fill out, and the TEA and THECB data. On Apply Texas there is no option for “foreign,” but there is an option for checking multiple races/ethnicities which is not a choice for TEA/THECB data. In order to resolve this any student who checked Hispanic was categorized as Hispanic, regardless of any other boxes s/he checked. This is consistent with The University of Texas at policy around categorizing students. Students in TEA/THECB data who chose “foreign” were marked as other in this dataset.

Table 3

Respondents by race (n = 194)

Variable	n	Survey percent	CNS 2016 freshmen percent
American Indian or Alaska Native	2	1.0	0.0004
Asian	45	23.2	29.74
Black or African American	9	4.6	5.60
Hispanic	55	28.4	23.52
Native Hawaiian or Other Pacific Islander	2	1.0	0.0004
White	80	41.2	31.87
No answer	1	0.5	0
Multiracial/foreign			8.02
Total	194		

Also of interest in this survey is first generation status of each student, shown in Table 4. The student answered questions about their parents' education level on the survey with the options for each parent:

- No high school
- Some high school, no diploma
- High school diploma or GED
- Some College
- Associate/Two-year Degree
- Bachelor's/Four-year Degree
- Graduate/Professional Degree
- Unknown or not applicable

If the student answered "Graduate/Professional Degree" or "Bachelor's/Four-year Degree" for either parent, then the student was coded as not first generation. If the student answered any other combination for both parents they were coded as first

generation. The decision to code “Some College” and “Associate/Two-year Degree” as first generation came from CNS practices in its first-year programs that view completing a four-year degree as having different experiences and overcoming different obstacles than a two-year degree or not finishing a four-year degree.

Table 4

Respondents by first generation (n = 194)

Variable	N	Percent
Not first generation	144	74.2
First generation	47	24.2
Total	194	

Title I schools are those classified by the federal government as “Schools in which children from low-income families make up at least 40 percent of enrollment” (US Department of Education, 2015). This classification allows schools to use the federal funding for the benefit of the entire school instead of targeting assistance to certain students in an effort to bridge the achievement gap between low-income students and other students. The Texas Education publishes which schools receive Title I funding as a campus so each student whom attended a school on the list was marked as attending a Title I school (Texas Education Agency, 2016A). Table 5 provides the frequencies for each category.

Table 5

Respondents by Title I school (n = 194)

Variable	N	Percent
Title I School	45	23.2
Not Title I school	149	76.8
Total	194	

The fourth category of interest in this research is whether the students came from a high school that promoted a college-going culture. Although many factors can go into creating a college-going culture, the scope of this research is limited to only look at the outcomes of the those cultures. In the fall of 2016, the overall rate of going on to higher education directly after high school in the state of Texas was 56.23%. Using this as the delineation, high schools who sent 56.23% or more students to higher education directly after high school, as recorded by the THECB, were considered college-going culture high schools. Those high schools who sent fewer than 56.23% of their high school graduates were marked as non-college-going culture. A total of 31 students who took the survey attended schools not in the THECB database either because they were out of state, private, or some other reason. Table 6 gives the breakdown of college-going culture.

Table 6

Respondents by college-going culture high school (n = 194)

Variable	N	Percent
College-going culture ($\geq 56.23\%$ HS to HE rate)	82	42.3
Non-college-going culture ($< 56.23\%$ HS to HE rate)	81	41.8
Missing	31	16.0
Total	194	

Finally, table 7 shows means by factor shows overall trends.

Table 7

Means by factors: Underrepresented minority and college-going high school

	Non-Under- represented Minority (n = 125)	Under- represented Minority (n = 68)	College Going HS (n = 82)	Non- College Going HS (n = 81)
Teachers in your high school	1.58	1.68	1.60	1.68
Your favorite teacher	2.35	2.54	2.35	2.57
Your least favorite teacher	-0.12	-0.06	-0.16	-0.05
A teacher, same race	0.82	0.93	0.91	0.85
A coach in your high school	0.39	0.44	0.21	0.58
A high school counselor	0.94	1.01	0.89	1.02
Your high school principal	0.40	0.34	0.30	0.23
Colleges who visited your high school	0.58	0.93	0.76	0.60
College prep programs	0.19	0.44	0.44	0.19
Your high school peers	2.02	1.60	1.94	1.80
The courses you took	2.15	2.03	2.23	1.89
A spiritual advisor	0.33	0.26	0.30	0.31
A community organization	0.35	0.09	0.21	0.23
Watching college sports	0.30	-0.03	0.09	0.15
Visiting a college campus	1.58	1.54	1.49	1.58
Attending a summer camp at a university or college	0.59	0.71	0.60	0.69
Your maternal-figure	2.16	2.31	2.24	2.27
Your paternal-figure	1.98	1.84	2.01	1.84
Another family member	1.48	1.72	1.72	1.49
Your sibling(s)	1.26	1.46	1.28	1.42
Facebook friends/groups	0.46	0.24	0.56	0.32
Facebook Newsfeed	0.14	0.00	0.33	-0.02
The internet in general	1.09	1.03	1.17	0.95
Twitter	0.16	0.35	0.12	0.40
Snapchat	0.20	0.31	0.26	0.32
Other social media	0.22	0.40	0.35	0.20
The music you listened to	0.38	0.57	0.37	0.48
TV	0.39	0.69	0.50	0.49
Texas's Top 10% Law	1.10	1.29	1.27	1.33
Financial aid for college	0.77	1.12	0.85	0.99

Table 8

Means by factors: First-generation and Title I school

	Non-First Generation (n = 144)	First Generation (n = 47)	Non- Title I School (n = 149)	Title I School (n = 45)
Teachers in your high school	1.53	1.85	1.62	1.62
Your favorite teacher	2.35	2.64	2.40	2.51
Your least favorite teacher	-0.14	0.04	-0.09	-0.11
A teacher, same race	0.78	1.13	0.74	1.29
A coach in your high school	0.23	0.98	0.42	0.36
A high school counselor	0.85	1.32	0.85	1.36
Your high school principal	0.32	0.53	0.48	0.04
Colleges who visited your high school	0.60	1.00	0.64	0.87
College prep programs	0.22	0.47	0.26	0.33
Your high school peers	1.92	1.68	1.93	1.58
The courses you took	2.18	1.91	2.26	1.62
A spiritual advisor	0.28	0.38	0.26	0.38
A community organization	0.27	0.23	0.32	0.00
Watching college sports	0.22	0.13	0.26	-0.13
Visiting a college campus	1.57	1.55	1.54	1.56
Attending a summer camp at a university or college	0.54	0.96	0.54	0.84
Your maternal-figure	2.16	2.40	2.15	2.44
Your paternal-figure	1.99	1.77	1.95	1.89
Another family member	1.45	1.94	1.55	1.64
Your sibling(s)	1.13	1.91	1.30	1.44
Facebook friends/groups	0.32	0.55	0.39	0.38
Facebook Newsfeed	0.04	0.26	0.05	0.16
The internet in general	0.99	1.30	0.97	1.31
Twitter	0.13	0.51	0.19	0.29
Snapchat	0.13	0.55	0.14	0.49
Other social media	0.15	0.62	0.19	0.51
The music you listened to	0.33	0.79	0.38	0.62
TV	0.40	0.77	0.41	0.71
Texas's Top 10% Law	1.04	1.64	1.12	1.36
Financial aid for college	0.70	1.53	0.85	1.09

There are several negative means in the above group. Overall, students saw their least favorite teacher as a hindrance to getting to college, with first generation students being the exception, but even their mean was close to zero. While averages for watching college sports were all close to zero, underrepresented minority students and students who attended a Title I school designated them as overall a hindrance to getting to higher education, suggesting that while athletics might be a method for some to get to college the act of watching them on television wasn't enough to draw students to The University of Texas at Austin.

Result of Research Questions

With the data loaded into SPSS several ANOVAs were run to look at the differences between traditionally underrepresented students and those who are more traditional in higher education. The ANOVAs compared the mean of each group's results to see if the means were statistically significantly different. To answer the first research question, a one-way ANOVA was conducted to evaluate differences within survey questions between the various designations of traditionally underrepresented students. Post hoc tests were not conducted because there were fewer than three groups for each question. The results of the ANOVAs provided evidence that the difference in some of the means between the groups was significant. Instead of listing all 124 one-way ANOVAs conducted (31 questions times four grouping factors) Table 9 provides only the results for the significant ANOVAs. The independent variables (IVs) were the student's race, first generation status, Title I school's status, or non-college going status, while the dependent variables (DVs) were the strength of influence answered on the survey to each question. The designation of IVs versus DVs was determined because students cannot

change their race/ethnicity, parents' education, or school's status, but the research question asks if those fixed variables inform the different sources of influence and the strength of that relationship. While a large number of ANOVAs were run, no correction for inflation of Type I error was applied because this was an exploratory study.

Table 9

One-way ANOVA of students grouped by types

	Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η_p^2
HS peers, IV: race	Between	1	7.72	7.72	4.982	0.03	0.02
	Within	188	291.38	1.55			
	Total	189	299.10				
HS coach, IV: first generation	Between	1	27.30	27.30	11.233	0.001	0.05
	Within	151	366.92	2.43			
	Total	152	394.21				
Another fam member, IV: first generation	Between	1	8.33	8.33	4.295	0.04	0.02
	Within	189	366.47	1.94			
	Total	190	374.80				
Sibling(s), IV: first generation	Between	1	21.72	21.72	11.725	0.001	0.06
	Within	189	350.15	1.85			
	Total	190	371.87				
Snapchat, IV: first generation	Between	1	6.46	6.46	4.719	0.03	0.03
	Within	188	257.35	1.37			
	Total	189	263.81				
Other social media, IV: first generation	Between	1	7.59	7.60	5.854	0.02	0.03
	Within	188	243.72	1.30			
	Total	189	251.31				
Music, IV: first generation	Between	1	7.30	7.30	4.571	0.034	0.02
	Within	189	301.87	1.60			
	Total	190	309.17				
Top 10% Law IV: first generation	Between	1	12.61	12.61	4.899	0.03	0.03
	Within	189	486.60	2.58			
	Total	190	499.22				
Financial Aid, IV: first generation	Between	1	24.44	24.44	8.99	0.003	0.05
	Within	189	513.86	2.72			
	Total	190	538.30				
HS teacher same race, IV: Title I school	Between	1	8.75	8.75	4.035	0.046	0.03
	Within	155	336.33	2.17			
	Total	156	345.08				
HS courses, IV: Title I school	Between	1	14.80	14.80	9.671	0.002	0.05
	Within	191	292.22	1.53			
	Total	192	307.02				
Facebook Newsfeed, IV: non-college	Between	1	5.08	5.08	3.946	0.049	0.02
	Within	160	206.06	1.29			
	Total	161	211.14				

The results of the one-way ANOVAs showed that statistically significant group mean differences were found for 12 items. Within race, high school peers were significantly *less* impactful for traditionally underrepresented students than for White and Asian students ($M_{URM} = 1.63$, $M_{nonURM} = 2.05$).

The greatest number of significant results was found for first generation students, with 8 significant differences. First, high school coaches were significantly more impactful for first generation students than for their counterparts ($M_{FirstGen} = 1.28$, $M_{nonFirstGen} = 0.28$). Similarly, another family member ($M_{FirstGen} = 1.94$, $M_{nonFirstGen} = 1.45$) and siblings ($M_{FirstGen} = 1.91$, $M_{nonFirstGen} = 1.13$) were more positively influential for first generation students. Outside of people first generation students reported Snapchat ($M_{FirstGen} = 0.55$, $M_{nonFirstGen} = 0.13$), other social media ($M_{FirstGen} = 0.62$, $M_{nonFirstGen} = 0.15$), music ($M_{FirstGen} = 0.79$, $M_{nonFirstGen} = 0.33$), financial aid packages ($M_{FirstGen} = 1.53$, $M_{nonFirstGen} = 0.70$), and Texas' Top 10% Law ($M_{FirstGen} = 1.64$, $M_{nonFirstGen} = 1.04$) to be significantly more influential in making it to The University of Texas at Austin than their peers whose parents finished at least a 4-year degree. Of note, since answers were given on a scale, the size of the difference in averages is interesting for high school coaches who scored a full point higher on average for first generation students.

Students attending a high school that received Title I funds for the entire school noted two significant differences. The first was that high school teachers of the same race as the student were significantly more influential for these students than those who did not attend a Title I school ($M_{TitleI} = 1.49$, $M_{nonTitleI} = 0.94$). Interestingly, high school

courses were significantly more influential for students in *non-Title I* schools than for those in Title I schools ($M_{TitleI} = 1.62$, $M_{nonTitleI} = 2.28$).

Finally, students in a high school with fewer than 56.23% of their graduates going on to higher education directly out of high school designated Facebook Newsfeed as significantly *less* influential than their higher college-going rate counterparts ($M_{CollegeGoing} = 0.33$, $M_{nonCollegeGoing} = -0.02$). It is of note that neither group found Facebook Newsfeed to be strongly influential or prohibiting.

To answer sub-research questions two and three, data were loaded into UCINET. The network mapping for the whole sample is a highly congested network that shows a high level of networking (Figure 3), as displayed by the strength of the ties. Because none of the survey participants (red dots) connect to other red dots, and because none of the sources of influence (blue dots) the map is a cacophony of egonets layered on top of each other. The next step in visualization was to pull the map apart and look at different subsets of students and influences (Figures 4, 5, 6, and 7).

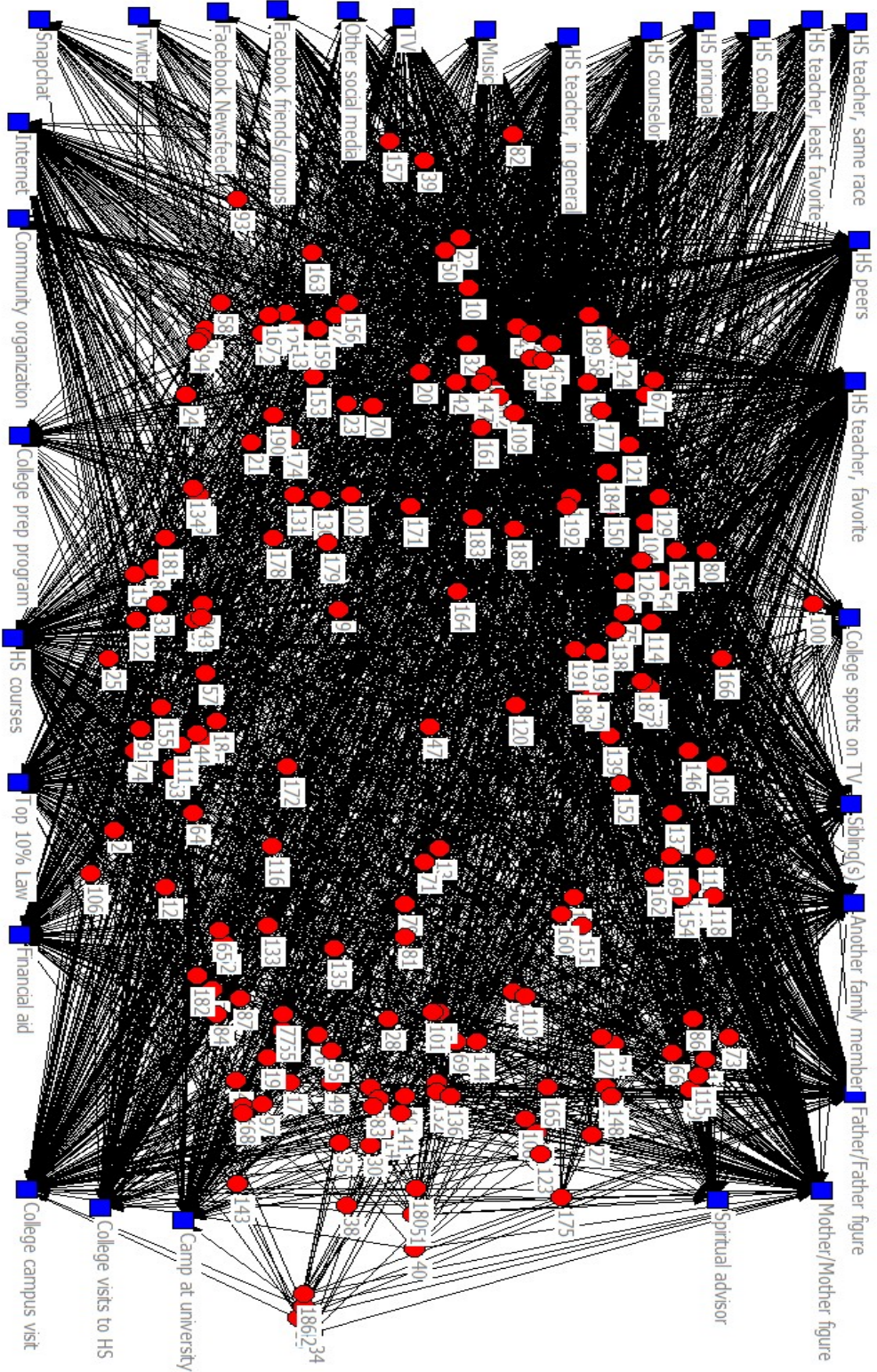


Figure 3
Complete network

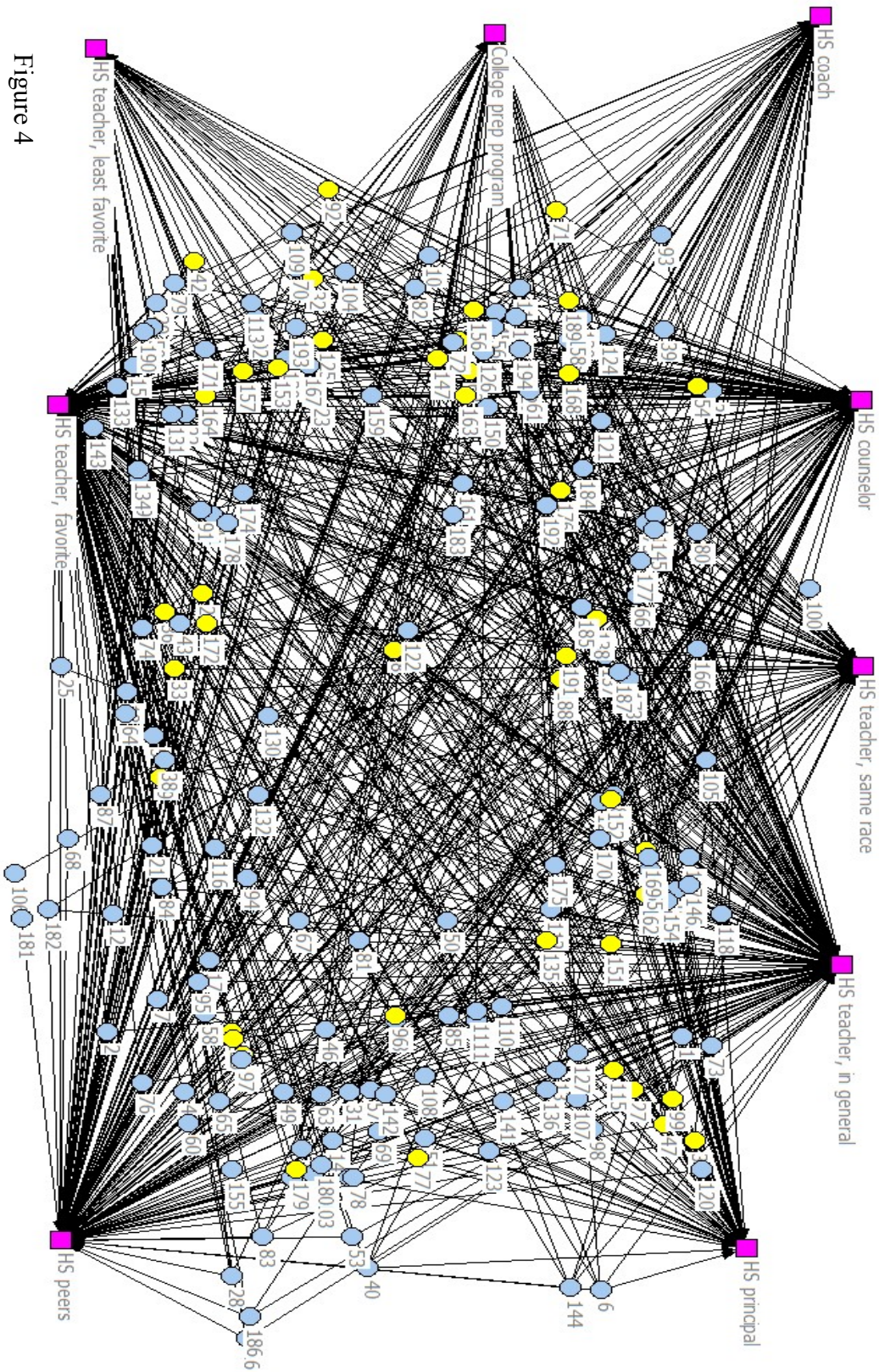


Figure 4
2-way communications within school

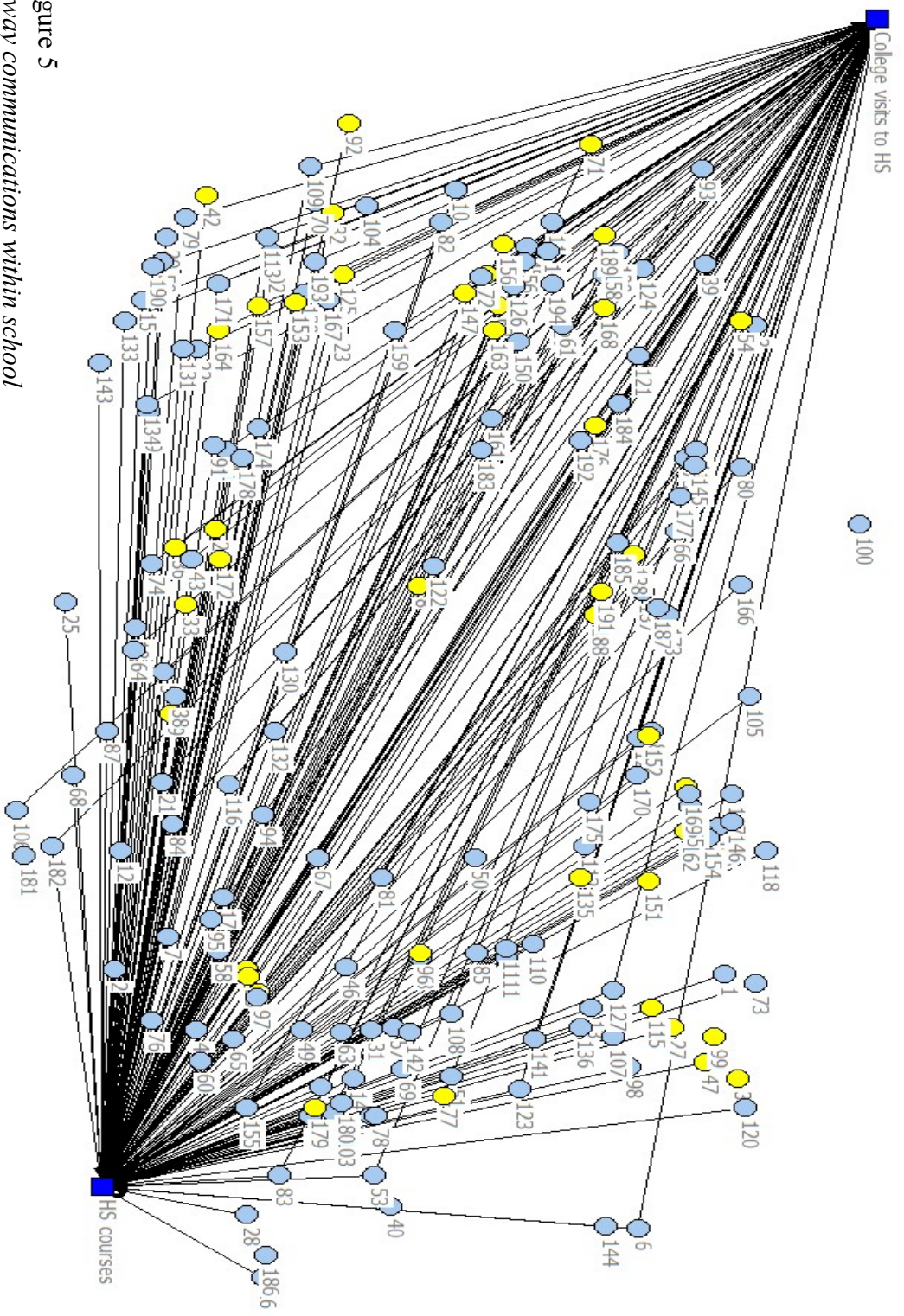


Figure 5
1-way communications within school

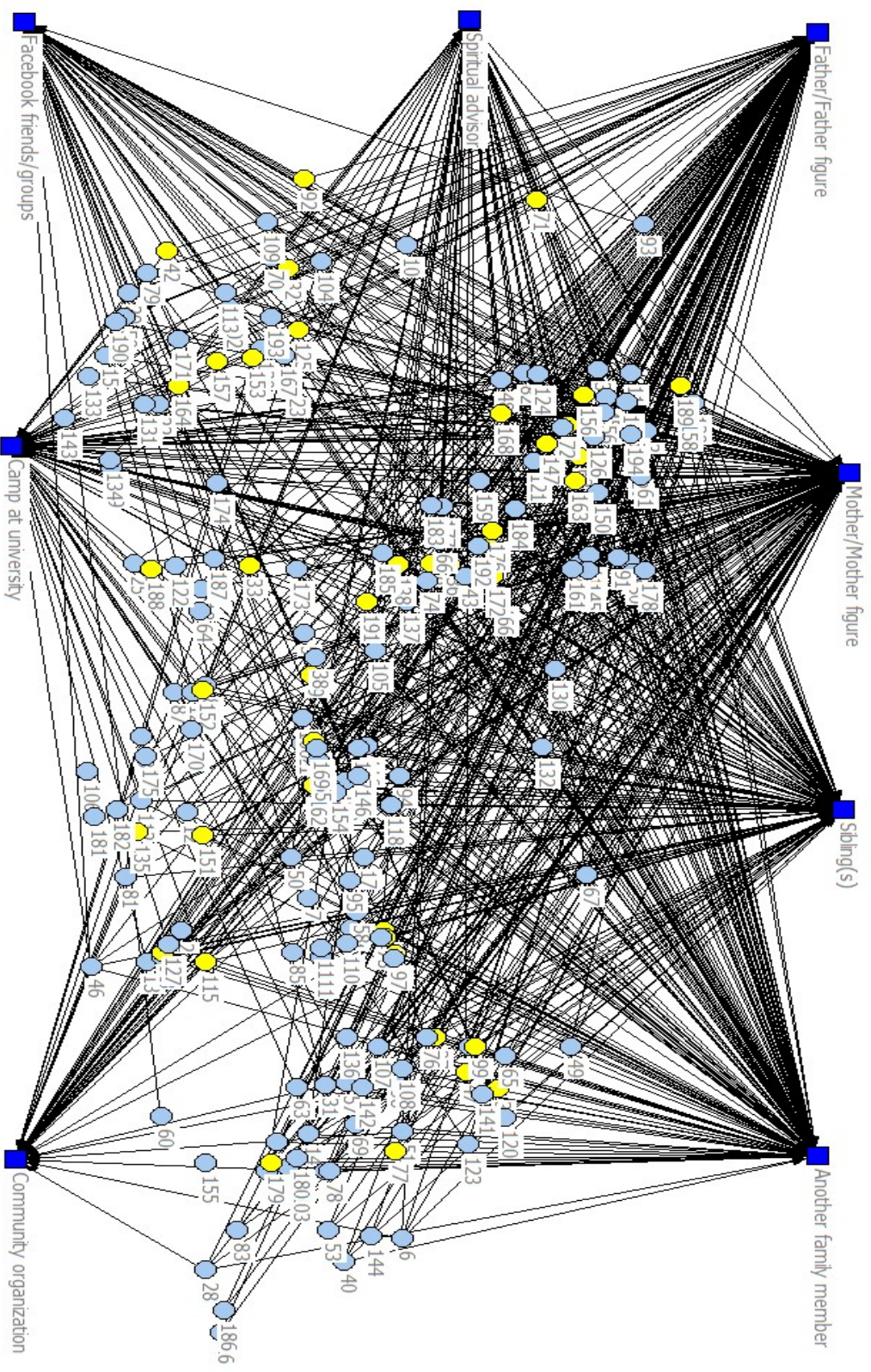


Figure 6
2-way communications outside of school

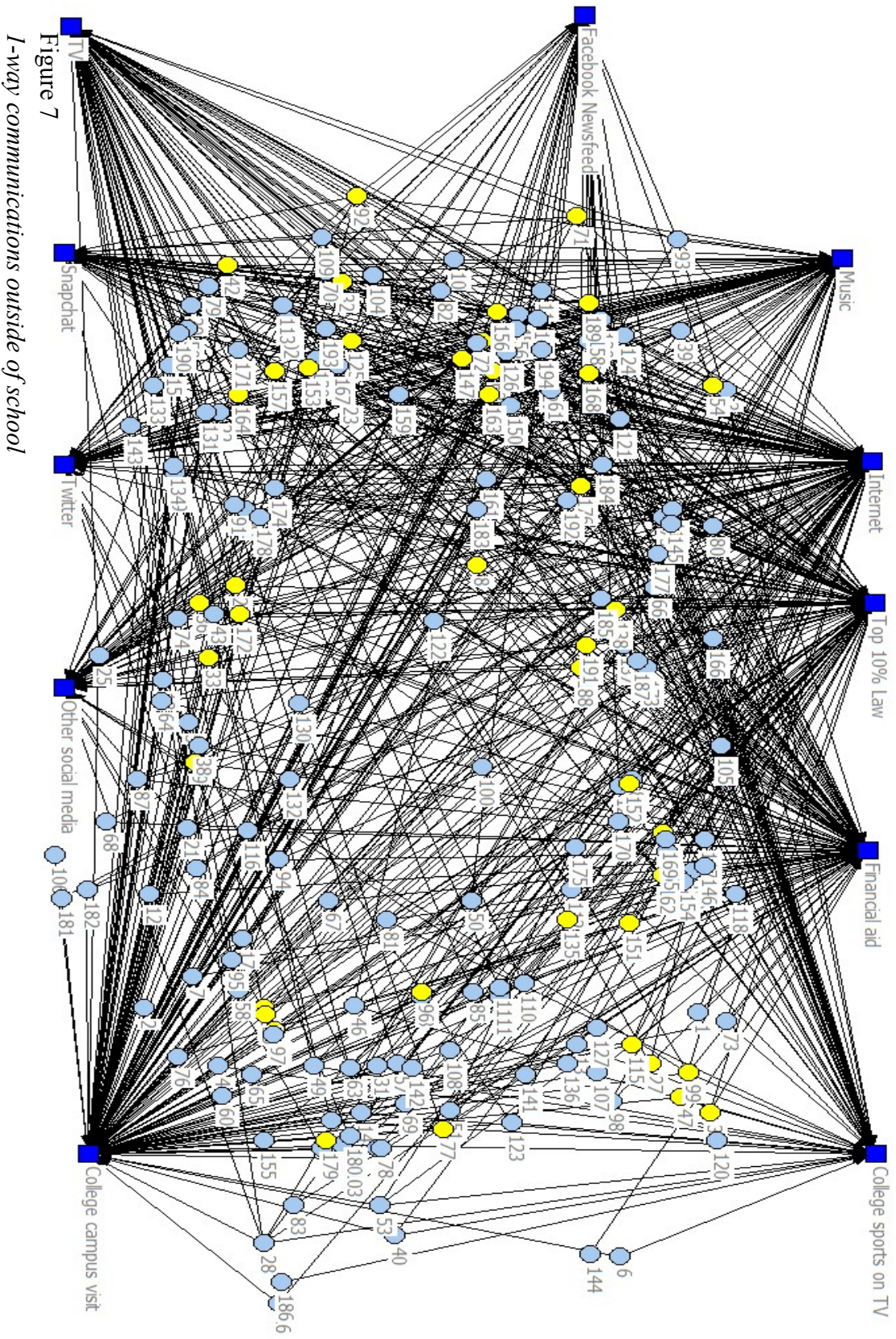


Figure 7
1-way communications outside of school

As noted in Chapter 1, one of the aspects this study looks at is the type of interaction and the location of the interaction (Table 1). Figures 3 – 7 show a lot of connections, and first generation students were marked as yellow dots for comparison, but with so many nodes (i.e. survey participants), a visual social network loses usefulness because of the busyness. Even after formatting the network map into a bipartite map, there are too many nodes to make a visual representation useful. Luckily, as with basic graphs such as pie charts, the chart itself is not the story, the numbers that create the chart are, and that is true in SNA as well. The researcher consulted with a data visualization specialist at the University of Denver, a social network analysis expert at the University of Texas at Austin, and a former University of Denver instructor of social network analysis. All three agreed there was no way to make the graphs any more visually meaningful. As such the research turns to the quantitative measurements provided by social network analysis to make more meaning of the data.

Table 1

Types and sources of influence

		<u>Location</u>	
		School	Family & Community
<u>Type of Communication</u>	2-way communication	<ul style="list-style-type: none"> • College Prep Programs • High School Peers • Teacher (same race) • Teacher (general) • Teacher (favorite) • Teacher (least favorite) • High school principal • High school coach • High school counselor 	<ul style="list-style-type: none"> • Facebook friends/groups • Community organizations • Spiritual advisor • Mother/maternal figure • Father/paternal figure • Another family member • Sibling(s) • Camp at a university
	1-way communication	<ul style="list-style-type: none"> • High school courses • College visits to high school 	<ul style="list-style-type: none"> • Campus Visits • College sports on TV • Facebook newsfeed • Internet • Television • Music • Twitter • Snapchat • Other social media • Financial Aid • Top 10% Law

One-way ANOVAs were run to look at the four categories for traditionally underrepresented students (underrepresented minorities, non-college going high schools, Title I schools, and first generation students). While the results of the ANOVAs comparing college-going high schools, traditionally underrepresented minorities, and Title I schools did not show any significant difference when compared by type of interaction and location, first generation students did show a significant difference in levels of positive influence with both people within school, and singular direction interactions outside of school (Table 10). These results suggest a way to target students

and areas to focus on such as increasing social media presence, working with coaches for college recruitment, and increased awareness of financial aid opportunities.

Table 10

One-way ANOVA of first generation students (IV) grouped by types (DV)

	Source	df	SS	MS	F	p	η_p^2
School- People	Between	1	2.918	2.918	4.427	.037*	
	Within	189	124.573	.659			0.00
	Total	190	127.491				
School- NonPeople	Between	1	.167	.167	.163	.687	
	Within	189	193.637	1.025			0.00
	Total	190	193.804				
NonSchool- People	Between	1	1.822	1.822	2.361	.126	
	Within	189	145.831	.772			0.00
	Total	190	147.653				
NonSchool- NonPeople	Between	1	4.647	4.647	6.555	.011*	
	Within	189	133.988	.709			0.00
	Total	190	138.636				

One of the measures social network analysis offers is a network's size. Size is defined as the number of alters directly connected to the ego (Carolan, 2014). Because the egonets are not connected to each other, the matrix is not a square, which limits the calculations done through UCINET, so the size was calculated in a different way for this research. In order to measure size, the data were loaded into UCINET and univariate statistics were run. Those results showed the number of observations for each participant; the number of times a participant ranked a source of influence denoted someone in their network (i.e. and alter), which is equal to size. Participants had the option of marking an influence with the value of zero indicating neither positive nor negative influence. Because the relationship was neutral those zero values were removed from the network to give a more accurate account of resources the participant actually used. Size of networks ranged from 3 to 30. In order to look at the data in more meaningful ways, participants were grouped

according to the four traditionally underrepresented factors, means were calculated and compared (Table 11). None of the ANOVAs were significant.

Table 11

One-way ANOVAs of network size by group

	Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η_p^2
First generation	Between	1	17.56	17.56	0.25	0.62	0.00
	Within	189	6830.39	36.14			
	Total	190	6847.96				
Underrepresented minorities	Between	1	59.02	59.02	1.61	0.21	0.01
	Within	191	7011.86	36.71			
	Total	192	7070.88				
Title I school	Between	1	9.28	9.28	0.25	0.62	0.00
	Within	192	7105.36	37.01			
	Total	193	7114.64				
Non-college going high school	Between	1	2.128	2.13	0.06	0.81	0.00
	Within	161	6086.04	37.80			
	Total	162	6088.17				

The second measure this research used within UCINET was density. Density is a measure of how many ties there are divided by how many possible ties there could be (Carolan, 2014). In essence, density is taking the size of a network, calculated in the previous paragraph, and finding what percent of the networks available to the participant were actually used. Survey values of zero and missing data were removed from the counts for present ties because missing data means there is no tie. A value of zero also indicates that there is no meaningful influence happening thus there is no tie. The same count of non-zero ties used in size was used in density. In fact, the calculation for size was divided by 30, the number of sources of influence the survey asked about. Density figured for each participant, then separated into four groups: college, Title I, first generation, and underrepresented minorities. Not surprisingly, because size found no

significant differences, the one-way ANOVAs for density also found no significant differences when using each of the groups as a factor (Table 12).

Table 12

One-way ANOVAs of network density by group (IV)

	Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η_p^2
First generation	Between	1	0.02	0.02	0.49	0.49	0.00
	Within	189	7.11	0.04			
	Total	190	7.13				
Underrepresented minorities	Between	1	0.06	0.06	1.61	0.21	0.01
	Within	191	7.30	0.04			
	Total	192	7.36				
Title I school	Between	1	0.01	0.01	0.25	0.62	0.00
	Within	192	7.39	0.04			
	Total	193	7.40				
Non-college going high school	Between	1	0.002	0.002	0.06	0.81	0.00
	Within	161	6.33	0.04			
	Total	162	6.34				

CHAPTER FIVE: DISCUSSION AND CONCLUSIONS

Summary

The purpose of this study was to discover what different sources of influence traditionally underrepresented students use to get to higher education, and if those sources differ than their traditional college-going peers. The intersection of three models were used as the conceptual framework: Gonzalez, Moll, & Amanti's Funds of Knowledge (2005), Yosso's Community Culture Wealth (2006), and Lin's Social Resource Theory (1990). The model includes different ways of looking at people and things around students to use as capital in the pursuit of higher education. To discover the most influential or most hindering influences in a student's life leading up to college, current first time in college (FTIC) freshmen attending The University of Texas at Austin (The University of Texas at Austin) in the College of Natural Sciences (CNS) were surveyed. The University of Texas at Austin was selected because it is the state's flagship university and because the State of Texas passed the *Top 10% Law* in 1997, granting automatic admission to anyone graduating in the top 10% of their high school class. The College of Natural Sciences at The University of Texas at Austin accepted 2,394 FTIC first year students in the fall of 2016, making it the largest undergraduate population at the university. CNS also enjoys a diverse student body, which made it ideal for studying to gain a larger perspective across diverse backgrounds such as low

socioeconomic, underrepresented minority, non-college going culture in high school, and first generation students.

The survey questions asked participants to rank a particular source of motivation they experienced while in high school from -3 (a strong barrier) to +3 (a strong influence). Topics ranged from people within their high school (e.g. teachers, coaches, and college prep programs) to ideas and things inside their high school (e.g. high school courses and college visits to their school), and people outside their high school (e.g. parents or parental figures, siblings, and spiritual advisors) to ideas and things outside of their high school (e.g. social media, college athletics on television, and financial aid packages). Students were also asked their ethnicity to denote underrepresented minority status, the name of their high school to match with State of Texas records about school Title I status as a measure for low socioeconomic status and with how many in their high school went on to higher education as a measure of a college-going culture, and their parents' highest level of education to denote first generation status. After survey answers were collected and high school information was matched from both the Texas Education Agency (TEA) and the Texas Higher Education Coordinating Board (THECB), the data were loaded into SPSS for statistical analysis and UCINET for social network analysis.

This study aims to answer the four following sub-research questions:

1. What are the frequencies, averages, types, and categories of sources of influence for students based on race, socioeconomic status, college-going culture in high school, and parent education level?

2. What would social network maps of these sources of influence look like and how would they relate to Community Cultural Wealth, Social Resources, and Funds of Knowledge models?
3. How do the different measures of size and density vary through different populations in the data set?

The analysis of one-way ANOVAs found that traditionally underrepresented minorities used their high school peers *less* than their White and Asian counterparts as a source of college influence, which answered question one. Students attending Title I schools found a high school teacher of the same race and their high school courses to be more influential in getting to college than their non-Title I counterparts. Students who attended a high school that sent fewer than the Texas average of 56.23% of their high school graduates to higher education immediately after graduating viewed their Facebook Newsfeed as less motivating than their counterparts. Finally, first generation students found a wide array of influences more statistically significant than their non-first generation peers. Siblings, a family member other than mother/father/siblings, Snapchat, another social media platform (other than Facebook, Twitter, and Snapchat), music, the Texas Top 10% Law, and financial aid packages were all larger sources of influence for this group than non-first generation students in CNS at The University of Texas at Austin.

While all of these were statistically significant, not all had meaningful effect sizes. For first generation students high school coaches, siblings, and financial aid had medium effect sizes, and for students attending a Title 1 school the courses at their high

school showed a medium effect size. These results can help focus efforts where they can make the most difference.

To answer questions two and three, the data were loaded into UCINET to run analyses. NetDraw, the visualization software that is part of the UCINET package, provided the social network maps to answer the first part of question two. Since the sample size was 194 students, the maps showed high levels of networking with different sources, but with so many nodes (1 student = 1 node) the graphs were overall congested and not useful.

Question three asked about the measures of size and density throughout the different groupings of students in the study: first generation, traditionally underrepresented minorities, Title I school students, and non-college going high school students. Size, the number of direct connections the ego (student) has with different alters (sources of influence), was measured by a simple count of how many connections there are. Missing data and values of zero were not counted. One-way ANOVAs showed that there were no statistically significant differences in network size associated with the four groupings of students.

Density is a measure of how many ties there are for an ego divided by how many possible ties there could be. Because all of the data are egonets and don't extend beyond a direct contact with the alter (i.e. the connection doesn't go from the student to the teacher to the principal) the measure of density is proportional to the size and thus also had no significant results, confirmed by the one-way ANOVAs.

Interpretation

This research study is situated at the intersection of three primary areas of scholarship: 1) Funds of Knowledge, 2) Community Cultural Wealth, and 3) Social Resource Theory. Additionally, the innovative use of social network analysis as a means to quantify the impact of roles and influence within communities of traditionally underrepresented students in higher education positions this study uniquely in the literature. While other studies have examined some of the different influences in high school students' lives, none examined them in a way that explicitly measured their effect on students pursuing post-secondary degrees. In a world that is more connected than ever, the importance of people and things outside of the school building needs to be examined as points of leverage to increase access to higher education. This innovative approach to the well-established college access body of literature adds depth and breadth to the ways in which we can better support traditionally underrepresented students to enter and stay in higher education. The application of social network analysis and looking across a larger swath of sources of influence fills a gap in the existing research regarding the personal journey to higher education for first generation students, low socioeconomic families, underrepresented minorities, and students graduating from a less than ideal college-going culture high school. This research also offers some applications for the findings in order to increase access to higher education.

Community Cultural Capital, Funds of Knowledge, Social Resource Theory

First generation students had significant results within their families (siblings and a family member other than their mother or father), with their social networks (high school coach, music, Snapchat and another social media platform other than Facebook

and Twitter), and working within policies and procedures (financial aid and Texas's Top 10% Law). While these are not the only strong sources of college-going influence in these students' lives, they are significantly stronger in a positive direction than non-first generation students. These findings resonate with Yosso's (2006) Theory of Community Cultural Wealth with a recognition that capitals, particularly in marginalized communities, come in many forms: navigational, aspirational, familial, linguistic, resistance, and social.

Similarly, students from low socioeconomic households (using Title I eligibility as a proxy for poverty) showed a significantly higher influence from a high school teacher of the same race and their high school courses. Gonzalez, Moll, & Amandti's (2005) Funds of Knowledge Theory came as a result of studying working-class Mexican families living in the southwestern United States and how these families used their social networks to mediate their uncertainty and disadvantage (Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011). Participants in this research study, also in financial uncertainty, show a use of their resources, available through social networks, as a means to at least partially mediate any disadvantage their school has as a result of low SES.

Table 13

Survey questions and the theoretical framework

Social Resource Theory (Lin, 1990)	Community Cultural Wealth (Yosso, 2005)	Funds of Knowledge (Gonzalez, Moll, & Amanti, 2005)
Snapchat	Siblings	High school teacher of same race
Other social media	Another family member	Another family member
Financial aid	High school peers	Siblings
Top 10% Law	High school coach	Music
High school coach	High school courses	
	Snapchat	

Through all of the possible sources of influence it was clear that traditionally underrepresented groups in higher education formed stronger ties with their social resources, which they used as currency to access higher education (measured by the size of their networks), with the one exception that not traditionally underrepresented students were more influenced by their high school peers than underrepresented minority students were. The increase in sources of influence for traditionally underrepresented students is supported by Lin's (1990) Social Resource Theory that said resources are goods that can be used in social situations as a form of currency, while Community Cultural Capital and Funds of Knowledge expanded the idea of what resources could be.

The difference between the results of the size and density of networks against the strength of the ties provides an interesting phenomenon opportunity to explore. These results indicate that while the number of connections a student makes throughout high school is relatively constant for all students, the intensity of them, both positive and

negative, varies. Stronger positive relationships tend to imply closer relationships. Perhaps this is one manifestation of Social Resources Theory where relationships are currency and traditionally underrepresented students view these relationships as a more valuable form of currency.

Implications and Applications

What do the findings mean in terms of application? The College of Natural Sciences at The University of Texas at Austin is in the process of hiring a full-time admissions coordinator for the college. One point of impact can be in the hiring process. CNS can look to hire someone who has earned at least a Bachelor's degree, and comes from one or more of the traditionally underrepresented backgrounds. This would enable the admissions coordinator to strategize, plan, and interact with prospective students in a different way than a White, middle-class, non-first generation applicant could. Also within the hiring process, some of the questions should attempt to get at the issue of seeing different leverage points to attract a more diverse group of students. If the Admissions Coordinator already views different capitals as forms of currency s/he will be able to use those as access points into traditionally underrepresented communities. Solórzano and Yosso (2001) looked at the five tenets of Critical Race Theory (CRT) in the context of education: 1) the intercentricity of race and racism, 2) the challenge to dominant ideology, 3) the commitment to social justice, 4) the centrality of experiential knowledge, and 5) the utilization of interdisciplinary approaches. Using these tenants can help frame interview questions such as "Describe your experience or explain how you have been educated to understand the history of African Americans, Latin@s, Asian, Native Americans, and other historically marginalized communities in the USA"

(Portland State University, n.d.). This question opens the door to see if the candidate views the history as both oppressive and asset-rich. Similarly, a prompt such as “Please describe a time when you had to alter or change deficit-based language in your own life. Why did you change and what did the process look like?” Self-awareness is key to connecting to students and their families, and this question looks at CRT’s interdisciplinarity and challenge to dominant ideology tenets.

The CNS Admissions Coordinator can also increase CNS’s visibility on social media platforms, especially Snapchat. Snapchat offers different filters users can apply to their photos and videos (Snapchat, n.d.), and CNS could create its own to promote the college. Since high school students use social media far more than they use e-mail, connecting to students of all backgrounds should take a different form than the now traditional e-mail. Another use for social media is a way to advertise different scholarship options and deadlines. Because financial aid was a significantly more influential factor for first generation students, CNS could flood social media with different opportunities, both within the college and out. CNS should also hold live videos via Facebook to give tips on how to create the best scholarship application possible to increase students’ chances of being awarded. Within the college there should be an annual reevaluation of the scholarships offered and how they are disbursed to ensure the college is attracting and retaining the best group of students it can, which should include diversity in all forms.

First generation students also reported a significantly stronger influence from high school coaches than non-first generation students. The University of Texas at Austin needs to explore how to involve coaches in the recruitment process more. Coaches often

already work closely with colleges and universities as part of the athletic recruitment process, which means they're already familiar with policies and procedures to help students navigate the application and matriculation process. If CNS could work with the Texas High School Coaches Association located in San Marcos, Texas, just 30 miles south of Austin, the relationship could strengthen and create new opportunities to recruit diverse students. The partnership could also create a more efficient way of reaching coaches to disseminate information and teach them about policies and procedures.

One of the significant sources of influence for students in Title I funded high schools was high school courses. While affluent large high schools offer Advanced Placement (AP) courses, not all high schools can, and especially the variety of courses in the sciences that high school students should take in order to prepare for college success. Small or rural high schools lack access to AP courses (Mader, 2015) and while a recent law in Texas requires colleges and universities to give credit for an AP score of 3 or higher (Watkins, 2015), if the high school doesn't offer the courses it doesn't make a positive difference to those students. One opportunity the College of Natural Sciences has is to offer online dual credit courses to high schools who don't or can't offer those subjects in AP. An example of the need is in Austin, Texas, where the high schools are split by Interstate 35. Not only do high schools west of I-35 offer many more AP courses, but students are passing at a much higher rate because of the greater average household income (McGee, 2016). One opportunity to equalize the college preparation and college access is to capitalize on students' influence from high school courses and offer online options through The University of Texas at Austin. Students would enroll in a dual credit course through their high school only it would be taught online by a The

University of Texas at faculty member. Not only would students gain greater access to advanced courses, they would also experience the culture of college, an opportunity that would help prepare them to enter higher education, and they would have an avenue for experiencing online courses which is the direction many core courses are going at The University of Texas at Austin. Already Introduction to Psychology, two required government courses, and Introduction to Microeconomics are primarily offered in an online format at The University of Texas at Austin (LAITS, 2017). In fact, the State of Texas could pave the way to offering more online dual credit courses for Texas high school students in general. Because teaching an online course needs resources, the Texas Legislature and/or Governor could allocate funding for the technology side of the process, as well as extra instructional funding for the faculty to teach. The Legislature should also allocate grants to aid high schools in upgrading or initially purchasing the necessary equipment to run the course in the school.

The Texas Top 10% Law and financial aid are two large policy areas for the State of Texas. After the Supreme Court ruling in favor of The University of Texas at Austin using race in admissions decisions, and after The University of Texas at System Chancellor Bill McRaven came out against the law, the Texas Legislature is set to discuss revamping or repealing the law in the 2017 session (Watkins, 2016). The Texas Legislature has an opportunity to continue a highly visible policy that attracts traditionally underrepresented students and if they change that it could have detrimental effects on providing a path to The University of Texas at Austin for those students.

Texas Lieutenant Governor Dan Patrick prioritized lowering tuition costs as a way to help make college more affordable for middle-income families (McGaughy,

2016). However, part of tuition is set aside for the financial aid of low-income students and Lt. Gov. Patrick's plan would help middle-income students at the cost of low-income students. First generation students, who are not necessarily low income, rated financial aid as a strong motivator to getting to college and if financial aid is cut that motivation would also leave. The Texas Legislature must stop cutting funding to higher education because financial aid is one of the easiest cuts to make on a large scale.

Policy within the University of Texas at Austin and specifically the College of Natural Sciences can also be influenced. Creating sustainable change is a challenge for even the most seasoned schools and organizations. According to Hargreaves and Fink (2006), "Innovations easily attract early enthusiasts, but it is harder to convince more skeptical educators to commit to the hard work of implementation" (p. 1). Indeed, economists reference an entire concept around resisting change because things have always been done a certain way: path dependency. Not only are the traditional ways more familiar to the players, but it is also often seen as more cost effective to continue with the same methods than to try new, more efficient products or practices (Investopedia, n.d.). The field of research around learning organizations can be implemented in higher education even though the research is most often around K-12 school systems.

Feedback loops and assessment are key to knowing if change is really happening within the organization. One opportunity CNS has is their accreditation process through the Commission on Colleges of the Southern Association of College and Schools (SACSCOC). Historically only departments were required to create assessment plans and the plans really only dealt with traditional academic outcomes such as being

proficient in introductory chemistry. The SACSCOC template requires participants to outline goals, outcomes, strategies/updates, methods, and target outcomes. Each program or department is required to create at least two goals and follow those through to the end for the year, and starting in 2017 non-academic programs and departments will also be required to complete the template. In order to create an increasingly inclusive culture, programs and departments, both academic and non-academic, should start looking at program assessment in the form of professional development by examining the staff and faculty's cultural proficiency since staff and faculty are a large part of the recruitment process. Lindsey, Graham, Westphal, Jr., & Jew's (2008) systematic method for looking at educational gaps through a culturally proficient lens offers five essential elements for parent and community communication: assessing cultural knowledge, valuing diversity, managing the dynamics of diversity, adapting to diversity, and institutionalizing cultural knowledge. Combined with training in Senge's (1990) disciplines of the learning organization, an examination of the staff's mental models around what students are the best recruits for the university, and activity to build a shared vision, and looking at staff/faculty/student/community relations as a larger system instead of siloed jobs could create a dynamic, uncomfortable, rich learning project for the entire department to engage in. The activity around breaking down and rebuilding mental models and re could be strongly influenced by Community Cultural Wealth and Funds of Knowledge. Moreover, Social Resources Theory would help reframe what a student's experience might look like both in the department or program and within the entire university system. For example, The University of Texas at Austin accepts many undocumented students and structural barriers these students continually navigate rarely enter a program's sphere of reference,

but looking at the elements of the admissions process for the entire university could help dismantle these barriers for students who are trying to enter college, and once they get to campus. Undocumented students cannot apply for departmental or programmatic jobs, they cannot go on course or program trips or study abroad without fear of needing to show papers, and they are not eligible for many types of financial aid. Instituting culturally proficient inquiry and training through a formal process such as SACSCOC accreditation can help recruit this educated, talented, diverse group of students and provide an experience they benefit from once they arrive.

Limitations

There are several limitations to this study. While this study was designed to be a quantitative study, the findings would greatly benefit from a mixed methods approach. While this study found aspects such as high school coaches and music are significant sources of influence in some students' lives, it cannot answer the important question of how and why they are significant. Is music significant because the lyrics dealt with higher education, or was the music motivating in general so it aided in pursuit of a personal goal? The quantitative values can't give us those answers, which means the recommendations that come as a result of this study could be off base. A semi-structured interview also has the potential to uncover sources of influence not on the survey. For instance, Former President Barack Obama was not included on the survey, but may have been a large influence in the decision to go to college in many students' lives, due to students' ability to relate to him as a person of color or being primarily raised by his grandparents.

The response rate of the survey was low. The sample size was large enough to give the study enough statistical power, but the 92% rate of non-response leaves a lot of voices unheard. While this study was never intended to generalize beyond the College of Natural Sciences at The University of Texas at Austin, the low response rate makes it difficult to confidently apply the findings to CNS. Another flaw with the survey was the timing of it (Porter, 2011). Ideally it would be given within a week of the students starting college, not the second semester of their first year. This delay creates a form of survey error caused by memory lapse.

One severe limitation to this study was the complexity of the possible choices of influence. While five broad categories were examined (friends, family, community, media, other), in an exploratory design such as this, there was no way to capture all possibilities.

Finally, this study did not examine the intersectionality of participants belonging to more than one traditionally underrepresented group. It could be that low SES White students had different sources of motivation than low SES Black or Latin@ students. Intersectionality is important because it tells an individual's story that cannot be covered by a single identifier and if that single identifier is used important parts of the participant's story could be misrepresented.

Positionality of the Researcher

Traditionally researchers have been thought of as either part of the group they are studying or outside of it, but there is blurring, and ethical considerations that need to be weighed when trying to access the field as an insider (Moore, 2011). My work as an Assistant Director at the university where I conducted my research naturally places me in

the grey: not one of them, but closely working with groups, and highly involved in their postsecondary lives. I chose surveying as the method of data collection, in part, because it removes me from my position of authority at The University of Texas at Austin and allows students to provide answers, or not provide answers, without feeling threatened by their choices or answers.

Another area of blurred lines is between my career at The University of Texas at Austin and my doctoral studies at the University of Denver. Because I attempted to use the students at the institution where I work in order to complete my studies at a different institution, I had to be diligent in keeping the two separate. For instance, I have great access to student data through my job, but I was strict in only accessing data which had been approved through an IRB through an approved colleague.

Finally, I am continually working to unpack my biases and privilege, and try to understand how they interact with my work as a researcher. I am a White, middle-class, cis-gendered, heterosexual, Christian, child of a college degree earner, who is an able-bodied US citizen. While I have my own challenges (as everyone does), I acknowledge my road through life is inherently different, often more privileged, than the population I studied.

Suggestions for future research

Several opportunities for future research emerge from this study. Most notably there is a need for a mixed methods approach to examine sources of influence for traditionally underrepresented students as well as traditional college-going students. Asking the question of *why* and *how* is a vital piece of the puzzle when making changes as a result of the survey answers. For example, “How did Snapchat influence you to get

to college?” If the answer is that it gave access to follow The University of Texas at Austin on it, that would elicit a different approach to using the medium than if the answer was, “I watched videos from college students going to parties.” The former gives direct control to The University of Texas at Austin where the other provides information that the student is on Snapchat, but not that they follow The University of Texas at Austin. Another opportunity is to skip the survey method altogether. College students are inundated with surveys and do not check their e-mail as much as they do social media platforms or text messages. If a survey is the best method, The University of Texas at Austin has campus-wide texting available to those who sign up for emergency alerts so a better way to reach the students would be to text them a link to a survey.

On the survey, the last source of influence question was “other” and a text box to enter their source. These are a sample of their answers:

- American dream
- Amount of diversity
- Boyfriend
- College programs
- League of Legends [an online video game]
- Jobs
- Where it’s located
- YouTube

While specifics like League of Legends probably wouldn’t elicit an overwhelming response, the idea of Massive Multiplayer Online Role Playing Games (MMORPGs) such as League of Legends and World of Warcraft could offer some other options

especially for the Computer Science students who attend The University of Texas at Austin. Not including relationship or significant other on the survey was a large missed opportunity that needs to be included in future research. Finally, the American Dream and jobs identifies a larger ideal that wasn't included and should be in the future. This is another area where a qualitative component would benefit the research, because other ideas than just those on the survey could surface.

A larger opportunity would be to replicate this study across all of the University of Texas at System schools to examine if there are differences across the state as far as influences. It could be that sources of influence are correlated to what type of higher education experience the student wants or is best suited for. If that is the case school systems could make changes within to better guide students to different opportunities. Similarly, replicating this study across multiple high schools could provide interesting results. Such a process could help answer whether it is the number or strength of influences that differentiate students who attend college versus those who don't go on to higher education. That study would help definitively answer if the leverage points found in this study make the difference for these students, or if the strong ties are common to most of the students at that high school and there's something else to focus efforts on.

Finally looking at a student's sources of influence while in college would also be beneficial to higher education and policy makers. Perhaps the sources stay the same (e.g. a student who found strong influence from a spiritual figure in high school will look to that same source in college), but maybe because the environment changes the student's sources of strength and influence also change. Institutions of higher education could

redesign the first year experience, as well as subsequent years, to better match the needs of a student.

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Appendices

APPENDIX A

Informed Consent Form Sources of Influence for Attending College

You are invited to participate in a study that will examine the level of influence several sources played in your decision to attend college. The study is being conducted by Becky Kester, a doctoral candidate at the University of Denver and a part of the The University of Texas at Austin community. Becky can be reached at (512) 217-0589, or becky.kester@utexas.edu. Alternately you can reach Becky's Faculty Advisor, Dr. Kristina Hesbol, at kristina.hesbol@du.edu.

Participation in this study should take 5 – 10 minutes of your time. Participation in this project is strictly voluntary. The risks associated with this project are minimal. If, however, you experience discomfort you may discontinue the survey at any time. We respect your right to choose not to answer any questions that may make you feel uncomfortable. Withdrawing or refusal to participate will involve no penalty.

Your responses will be kept completely confidential. I will NOT know your IP address when you respond to the Internet survey. Your responses will be identified by code number only and will be kept separate from information that could identify you. This is done to protect the confidentiality of your responses. Only Becky, the researcher, will have access to your individual data and any reports generated as a result of this study will use only group averages and paraphrased wording. However, should any information contained in this study be a subject of a court order or lawful subpoena, the University of Denver might not be able to avoid compliance with the order or subpoena. Although no questions in this interview address it, we are required by law to tell you that if information is revealed concerning suicide, homicide, or child abuse and neglect, it is required by law that this be reported to the proper authorities.

Results of the study will be used for scholarly purposes only. The results from the study will be presented in educational settings and at professional conferences, and the results might be published in a professional journal in the field of education.

If you have any questions or concerns about your research participation or rights as a participant, you may contact the DU Human Research Protections Program by e-mailing IRBAdmin@du.edu or calling (303) 871-2121 to speak to someone other than the researchers.

You may print this page for your records. Please agree to participate if you understand and agree to the above statement. If you have any questions, please contact the researcher before agreeing to participate.

By beginning the survey, you acknowledge that you have read this information and agree to participate in this research, with the knowledge that you are free to withdraw your participation at any time without penalty.

APPENDIX B



Dear CNS First-Year Student,

My name is Becky Kester and I am a doctoral student from the Educational Leadership and Policy Studies department at the University of Denver and a part of the The University of Texas at Austin community. I am writing to invite you to participate in my research study about identifying your sources of influence and strength in getting to college. I'm trying to find who or what really supported you and/or inspired you to not only pursue higher education but helped you on your journey to make it to the Forty Acres. You're eligible to be in this study because you are a first year student in the College of Natural Sciences, less than a year out of high school. I obtained your e-mail address from the College of Natural Sciences.

If you decide to participate in this study, you will answer some multiple choice survey questions. The entire survey should take 5 – 10 minutes tops.

Remember, this is completely voluntary. You can choose to be in the study or not. If you'd like to participate or have any questions about the study, please e-mail or contact me at becky.kester@utexas.edu.

Thank you very much.

Sincerely,
Becky

Take the survey here: [URL]

APPENDIX C

Kester, Becky G

From: Tieu, Holly
Sent: Friday, June 19, 2015 12:52 PM
To: Kester, Becky G
Subject: RE: My Department Isn't Listed

Becky,

UT Austin IRB review is required of UT Austin faculty, staff, and students who are conducting research on behalf of the University.

In your case, you are not conducting the research as a University staff member, but rather University of Denver student. Thus, our IRB does not have purview over your activities and you do not need to submit to our IRB for approval.

Please contact the University of Denver IRB office and the UT Austin department to discuss the logistics of when you can contact participants relative to when University of Denver IRB approves your protocol to begin.

Regards,
Holly

Holly Tieu
Sr. Program Coordinator, COI and IRB
Office of Research Support
The University of Texas at Austin
Flawn Academic Center, FAC 426U
512-232-2044/Fax 512-471-8873
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APPENDIX D



COLLEGE OF NATURAL SCIENCES

Dean's Office

120 Inner Campus Dr., Stop G2500 • Austin, TX 78712-1252 • (512) 471-3285 • FAX (512) 232-1045

July 1, 2015

Office of Research and Sponsored Programs
University of Denver
2199 S. University Blvd., 222 MRB
Denver, CO 80208

To Whom It May Concern:

Rebekah Kester has requested permission to collect research data from students through a project entitled *Pre-College Sources of Influence for Traditionally Underrepresented Students Attending College*. I have been informed of the purposes of the study and the nature of the research procedures. I have also been given an opportunity to ask questions of the researcher.

As a representative of The University of Texas at Austin, I am authorized to grant permission to have the researcher receive a download of student e-mail addresses from the College of Natural Sciences. Rebekah is also permitted to collect research data via survey from our students. The researcher has agreed to the following restrictions: provide a copy of published results.

If you have any questions, please contact me at (512) 232-0677.

With best regards,

A handwritten signature in black ink that reads "David A. Vanden Bout".

David A. Vanden Bout
Associate Dean, College of Natural Sciences

APPENDIX E

Source of Influence--THEME	Source of Influence--SPECIFIC	Literature Support
School	Teacher in general	Gonzalez, Stoner, & Jovel, (2003); Gonzalez, et al. (2015)
	Teacher of same race/ethnicity	Dee (2004)
	Coach	Engberg, M. E., & Wolniak, G. C. (2010).
	Guidance Counselor	Wimberly and Noeth (2002); Gonzalez et al. (2003)
	Principal/AP	Theoharis (2009); Stone & Clark (2001)
	College Fairs	Swail, W. S., & Perna, L. W. (2002)
	College Prep programs (AVID, GEAR UP, CollegeForward)	Fenske, Geranios, Keller, & Moore, 1997
	Peers	Gibson, Gándara, & Koyama, 2005; Kindermann, 1993; Perna & Titus, 2005; Ryan, 2000; Tierney & Coylar, 2005
	Courses (AP, dual credit, concurrent enrollment)	Bailey, T. R., & Karp, M. J. M. (2003).
Community	Spiritual Advisor	Taylor & Chatters, 2010
	Organizations (Big Brothers Big Sisters)	COOPER (2002)
Higher Education	Athletics	Sperber, M. (1990)
	Campus visits/proximity	Frenette, 2004; Turley, 2009
	summer camps	Engle, 2007
Home	Parents	Perna & Titus (2005); Gonzalez et al. (2003)
	Siblings	Ceja, M. (2006)
Technology	Social Media in	Smith, A. (2014)

	general	
	Facebook friends/groups	Smith, A. (2014)
	Facebook Newsfeed	Smith, A. (2014)
	Internet	The Council of Economic Advisers, 2014
	Television	None
	Music	North, Hargreaves, & O'Neill, 2000; Schreiber, 1988
	Twitter	Smith, A. (2014)
Policy	Top 10%	Niu & Tienda, 2010
	Financial Aid	Berkner & Chavez, 1997; Duan-Barnett, 2013
Personal Questions	Gender	
	High school attended	
	First gen?	
	Willing for follow up?	

APPENDIX F

Please rate the following on how influential they were in your decision to attend college. -3 indicates a strong negative influence and +3 indicates a strong beneficial influence.

A teacher in your high school

-3 -2 -1 0 1 2 3

A teacher in your high school who shares your identified race/ethnicity

-3 -2 -1 0 1 2 3 N/A

A coach in your high school

-3 -2 -1 0 1 2 3

A counselor in your high school

-3 -2 -1 0 1 2 3

Your high school principal

-3 -2 -1 0 1 2 3

Your high school assistant principal

-3 -2 -1 0 1 2 3

Colleges who visited your high school

-3 -2 -1 0 1 2 3 N/A

College prep programs (e.g. AVID, GEAR UP, CollegeForward)

-3 -2 -1 0 1 2 3 N/A

Your high school peers

-3 -2 -1 0 1 2 3 N/A

The courses you took in high school

-3 -2 -1 0 1 2 3 N/A

A spiritual advisor (e.g. a priest, Rabbi, Imam)

-3 -2 -1 0 1 2 3 N/A

A community organization (e.g. Big Brothers, Big Sisters, YMCA)

-3 -2 -1 0 1 2 3 N/A

Watching college sports teams

-3 -2 -1 0 1 2 3 N/A

Visiting a college campus	-3	-2	-1	0	1	2	3	N/A
Attending a summer camps at a university or college	-3	-2	-1	0	1	2	3	N/A
Your mother/maternal figure	-3	-2	-1	0	1	2	3	N/A
Your father/paternal figure	-3	-2	-1	0	1	2	3	N/A
Another family member	-3	-2	-1	0	1	2	3	N/A
Your sibling(s)	-3	-2	-1	0	1	2	3	N/A
Facebook friends/groups	-3	-2	-1	0	1	2	3	N/A
Facebook newsfeed	-3	-2	-1	0	1	2	3	N/A
The internet	-3	-2	-1	0	1	2	3	N/A
The music you listen to	-3	-2	-1	0	1	2	3	N/A
Twitter	-3	-2	-1	0	1	2	3	N/A
Television	-3	-2	-1	0	1	2	3	N/A
Texas's Top 10% Law	-3	-2	-1	0	1	2	3	N/A
Financial aid for college	-3	-2	-1	0	1	2	3	N/A

Which high school did you attend?

Name:

City:

State:

“Ethnicity and Race:

Are you Hispanic or Latin@? (A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race)

Yes

No”

(Apply Texas, 2014)

“Please select the racial category or categories with which you most closely identify. Check as many as apply.

American Indian or Alaska Native

Asian

Black or African American

Native Hawaiian or Other Pacific Islander

White”

(Apply Texas, 2014)

Your Gender:

Male

Female

Non-binary/third gender

Prefer to self-describe _____

Prefer not to say

(Human Rights Campaign, 2016)

“Father’s education level

No high school

Some high school, no diploma

High school diploma or GED

Some College

Associate/Two-year Degree

Bachelor’s/Four-year Degree

Graduate/Professional Degree

Unknown or not applicable”

(Apply Texas, 2014)

“Mother’s education level

No high school

Some high school, no diploma

High school diploma or GED

Some College

Associate/Two-year Degree
Bachelor's/Four-year Degree
Graduate/Professional Degree
Unknown or not applicable"
(Apply Texas, 2014)