

Minnesota Career and Technical Education: MnSCU Applicants and the Influence of  
Homophily

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## Dedication

I dedicate this work to the neglected majority that Parnell wrote of more than 30 years ago. The majority of my fellow Minnesotans obtained their postsecondary education at community and technical colleges. Colleges statewide that educate Minnesotans for work without the benefit of endowed professorships or president's circle donors. This unheralded majority are the center of gravity of Minnesota's workforce, tax base, and citizenry.

Above all others, I dedicate this written work to my partner Dan. He is a rare renaissance man educated in the classical languages and sciences who works in the modern technocracy of the Minnesota metro. I am supremely grateful for our intellectual discourse; his fondness of my MnSCU focused empirical research, and his patience with my lengthy doctoral process. Thank you for the unwavering support with my research during the past 3 years.

## Abstract

This study explored the relationship between community college applicant educational aspirations, proximity of college to home, and the influence of homophilic factors on applicant choices. This quantitative study was conducted with archived applicant data from the 2013 academic year of Minnesota State Colleges and Universities (MnSCU) applicants. The 2013 applicants intent to attending a MnSCU community college or technical college were included in the study; applicants intent on attending any of the seven state universities were excluded from the study. The dataset was assembled from the answers given by 28,520 applicants on the MnSCU Universal Application. The study results indicate a direct relationship between the applicants' distance from home to MnSCU college of choice for both rural and metropolitan applicants. The study found a slight relationship between racial diversity with proximity of college of choice to home of record. The results showed no relationship to gender and proximity of college to home. This study also explored overall dispersion of educational levels that community and technical college applicants aspire for and their parents obtained in the population of 2013 MnSCU Universal Applications. The applicant educational aspiration trends were studied comprehensively among the 31 distinct MnSCU colleges across the state of Minnesota. The study conclusions were threefold: applicants overwhelmingly chose colleges within 5 miles of home; demographic factors had little influence on applicant decisions regarding educational degrees they intended to pursue; and demographic factors were highly prevalent in applicant choices of fields of study, especially in the rural community and technical college applicant cohorts.

**Keywords:** Homophily, career and technical college, postsecondary education, CTE

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## Chapter 1: Introduction

Higher education is bifurcated; one of these two educational domains has a bevy of research done in the many fields and disciplines within academic circles. The other discipline of higher education, career and technical education (CTE), has been in steady research decline for more than a decade. What is presently coined *higher education* in conventional terms is liberal arts degree producing colleges and universities. In the liberal arts vein of higher education, volumes and libraries full of research exist in areas such as curriculum, STEM, not-for-profit versus for-profit, graduation and degree conferment rates, matriculation rates, ad infinitum. However, the sheer volume of recent research in postsecondary education tends to be predominately in one of the two main higher education domains, namely liberal arts universities. This focus needs to be balanced with a shift of academic focus and research placed on CTE, as this is the postsecondary education path of the majority of Americans.

Research regarding CTE, quite possibly the larger field of higher education, has been scant and almost absent in scholarly journals for more than the last 10 years. That missing half of the dual component higher education system in the United States is vocational education, predominantly called CTE. Research pertaining to CTE, tends to involve education for work, and has been limited in the academic realm. This dearth of scholarly work in the CTE field leaves many unanswered questions about trends over time compared to conventional higher education or liberal education. Some of this lack of research emphasis may be because of a series of compounding factors and influences. A push by secondary educators exists for all secondary students to attend universities for degree attainment. The public messaging via government leaders, both elected and bureaucrat leans toward college for all with many campaign promises made about the

affordability of college being linked to the idyllic, albeit contrived American Dream. Prevalent research funding streams at larger universities are not typically available to CTE institutions and their faculty. Unlike large universities categorized by divisions, categories, and educational tiers, CTE lacks a coherent system beyond the state level. CTE institutions are far more reliant on government funding compared to other higher educational venues. These are but a few potential compounding reasons that higher education research in CTE has dwindled. I intend to begin to reverse this trend with deliberate academic research into CTE focused on meta-analysis of the state community and technical colleges of Minnesota.

From a theoretical standpoint, educational philosophers, such as Piaget, Rousseau, Montessori, and Dewey (1916), argued for a constructivist approach in education pressing for the application and building of knowledge in a more holistic and transactional way than the pedagogical purists (Labaree, 2010, Drost, 1977). In modernity, educational philosophers and learning theorists, such as Knowles (1990) and Kolb, have stressed adults have different motivations and learning styles than youth and require experiential or transformative learning models to engage in lifelong learning. The constructivist approach to learning aligns well with the tenants of andragogy espoused by these progressive educational theorists who stress transactional, contextual, application, meaning making, cognition, experience, logos with pathos, intrinsic, tacit, and hands on learning. Above all other voices in the field of adult education and education for work, authors, such as Lazerson and Grubb (1974, 2005a, 2005b), and in Minnesota Copa, Lewis, and Pucel reiterated the overwhelming need for CTE for an educated citizenry and workforce be firmly rooted in an andragogical approach to education.

In addition, antagonists argue that technical education is neither warranted for collocation in the curriculum of educational systems nor is it on equal footing in the echelon of higher education. Past and present educational philosophers, educational academics, and administrators have argued for the comparative value and worth of pedagogical based liberal arts education and against the experiential based education of andragogy. The pedagogical approach to education aligns with transmissional, content, conceptual, memorization, computation, didactic, abstract, and extrinsic-based instruction from texts. Although the educational psychologists and educational philosophers from the inception of the modern high school and college in the early 1900s were true pedagogues, they were also true vocational educational philistines who ensured vocational education was entirely separate in the curricula at all levels of education. Some of the early and most ardent voices in the segregation and lower educational standing of technical education included Snedden, Prosser, Ayers, Charters, and Bobbitt (Labaree, 2010, Benavot, 1983, Hayward, 2004, Kantor, 1986, Wendt, 1946, Goodwin, 1989).

Despite all the potential reasons CTE research has declined in both variety of research and frequency of published works, the need for and sheer number of vocational education adult learners is higher than ever. Still, the level of research in this component of higher education is at an all-time low, possibly going as far back as the last major overhaul of the Carl Perkins Act or the watershed report in the 1983 *A Nation at Risk*. The Office of Vocational and Adult Education within the Department of Education terminated funding and resourcing the National Center for Research in Vocational Education (NCRVE) (OVAE, *A Blueprint for Transforming CTE*, 2013). At the federal agency level, the NCRVE was the hub of national research into CTE, but was closed in

December of 1999 (Gordon, 2008, p. 212). Soon after, the national level professional association of vocational education research changed their organizational name and downsized, leaving the University of Minnesota (UMN) vacant of the NCRVE that once resided on campus. Previously named the American Vocational Education Research Association (AVERA), the association was renamed the Association for Career and Technical Education Research (ACTER) in December 2004. The final re-designation of the field in 2006 came with the renaming of the federal legislation to the Carl D. Perkins Career and Technical Education Improvement Act (Blandford, 2012).

Concurrent with these name changes, the enumeration of scholarly journals for research into vocational education and the overall volume of research in the field declined precipitously in the same timeframe from 1999 to 2006. A simple Boolean search in Academic Search Premier within scholarly journals for *university education* returned 9,319,316 total articles. A similar ERIC Boolean search of *career and technical education* returned 112 total peer reviewed articles, of which the majority were at the secondary schooling level. The problem is a lack of emphasis on the CTE branch of higher education compounded by a lack of research on CTE within the higher education domains (Billet, 2014, Kotamraju, 2007, Rojewski, 2002).

Some in academia argue CTE does not rise to the level of higher education, nor does it warrant a place within the curriculum of postsecondary educational institutions that confer degrees. Under this logic, CTE is misplaced within the curriculum of the American public school system (Lewis, 1994, Hyslop-Margison, 2005). At the federal government level, the National Center for Education Statistics (NCES; 2014) made a distinction between typologies of education at the postsecondary level. The NCES stated, “Postsecondary education in the United States includes academic, career and technical,

and continuing professional education programs after high school. American colleges and universities and technical and vocational institutions offer a diverse array of postsecondary education experiences.”

([http://nces.ed.gov/programs/coe/indicator\\_tua.asp](http://nces.ed.gov/programs/coe/indicator_tua.asp), 2014). At the secondary level, the yearly national metrics demonstrate a multi-decade decline in the number of technical education courses and technical preparation programs nationwide. Concomitantly, the number of technical educators has dwindled in the last 3 decades at the secondary school level as well (Hyslop-Margison, 2004, Lewis, 2007, and Palmer & Gaunt, 2007).

This decline in educators is the inverse of the trend among American adults that has shown increased enrollments, both in the liberal arts degree producing institutions and CTE educational institutions. The NCES (2014) projected total enrollments during this decade from 2012 to 2022 would continue to increase from 20 million to 28.8 million enrolled students in all postsecondary degree producing institutions. Further, NCES archived statistical reports showed the total of CTE enrolled students nationwide was 19.4 million in the 2007–2008 academic year

(<http://nces.ed.gov/surveys/ctes/tables/P41.asp>, 2014). Therefore, it is unclear why secondary school systems continue cutting technical education programs and educators from the curriculum when the demand is high and the high school dropout rates are at record high levels in America. Moreover, federal and state funding has declined during the last decade, even though the enrollments nationwide have markedly increased and are projected to continue increasing by the national research centers charged with tracking this longitudinal U.S. trends (Carpentier, 2006, Grubb, 2009).

Snedden and Dewey’s debates from 100 years ago is just as vivid and alive in the early 21st century. The need for balance between liberal arts and vocational education

for the citizenry of America and attaining the right balance for both an educated citizenry and educated workforce is significant. In addition, the need to rebalance the research between the dual components of higher education is also just as pressing in the 21st century as when the Vocational Education Act was first drafted in 1963(Coming of Age, 1976). A conscientious start to regain lost ground in furthering research in CTE is exemplified in this meta-analysis (Gordon et al, 2010) to analyze a portion of college system level data available on CTE in Minnesota.

### **Definition of Terms**

The following terms provide an important juncture to ensure recurring terms are made explicit for the balance of this written work on Minnesota State Colleges and Universities (MnSCU). For this study, terms used are defined as follows.

**AA** – Associate of Arts degree; 2-year general degree with a broad focus, tends to be the feeder for students intent on obtaining a degree and transferring to a 4-year college.

**AAS** – Associate of Applied Science degree; 2-year degree with a specific focus in a technical field with a science based program of instruction the tends to lead to a technical credential.

**Accuplacer** – a proprietary enrollment placement test distributed online by The College Board to assess skill level in mathematics, reading comprehension, and writing prior to entry to postsecondary education at MnSCU community and technical colleges.

**ACTER** – Association for Career and Technical Education Research.

**AFA** – Associate of Fine Arts degree; 2-year degree with a specific focus on an occupational field with an artistic based program of instruction that tends to lead to an artistic credential.

**Andragogy** – the education of adults, learning style, and methodology led by instructor or facilitator; learning with adult learners, marked by experiential learning and shared experience.

**Applicant** – any person who self-selects to complete and submit the MnSCU Universal Application for coursework at any MnSCU college.

**AS** – Associate of Science degree; 2-year degree with a general science focus, and a typical feeder for students intent on obtaining a degree and transferring to a 4-year college.

**AVERA** – American Vocational Education Research Association, renamed ACTER in 2004.

**AVTI(s)** – Area Vocational Technical Institutes; the precursor to technical colleges in the MnSCU system until the 1970s.

**Certificate** – written proof of completion of an accredited program of instruction or training in an occupational field.

**Community College** – a degree conferring postsecondary education institution within the MnSCU system of colleges that focusses on transfer students and 2-year degrees.

**Credential** – written proof of completion of an accredited program of instruction that tends to confer to the recipient a technical or occupational competency in a select area or field, usually after a prescribed set of courses and examinations are successfully completed.

**CTE** – career and technical education; the modern term for vocational education, occupational education, technical education, and training.

**DOE** – U.S. Department of Education; a secretary or commissioner level agency charged with implementing educational policy and funding of public education for both secondary education and higher education in the state or federal government.

**Enrollee** – an applicant who has submitted the MnSCU Universal Application, taken the Accuplacer or another collegiate placement test, and has been accepted fully or conditionally to a college within MnSCU.

**Higher Education** – a generic term for all education that pursues a degree or credential beyond a high school diploma.

**Homophily** – the sociological principle whereby people tend to associate with others like themselves, and self-selecting to socialize with those similar to themselves on several socioeconomic, demographic, professional, and educational factors or categories.

**HRD** – human resource development; a branch of the HR field that focusses on the social science of developing human capital with education and training, distinct from HR found in managerial science or business sector affiliated HR management in conjunction with Human Resources and Industrial Relations.

**Liberal Arts Education** – classical education style and methodology marked by a focus on academic knowledge that is theoretically based on the premise of knowledge for knowledge sake.

**MnSCU** – Minnesota State Colleges and Universities is a system of 31 institutions, consisting of 54 campuses, and community and technical colleges, plus 7 state universities that are publicly funded, not-for profit educational institutions that offer training courses through doctoral degrees



**NCRVE** – National Center for Research in Vocational Education, the previous national level research center for vocational education, ceased to be funded by OVAE and dissolved in 1999.

**NCES** – National Center for Education Statistics, a research-focused subsidiary within the national level federal agencies that align under the Department of Education.

**NCLB** – No Child Left Behind legislation is an Act of Congress signed into law in 2001 regarding accountability and testing to measure educational effectiveness and rank secondary school districts.

**Occupational** – a specific area, field, work, or studies that tend to be technical or vocational.

**OVAE** – Office of Vocational and Adult Education, directorate within the U.S. Department of Education at the national level that guides federal policy and funding of vocational and technical education nationally.

**Pedagogy** – the education of children, learning style, and methodology marked by a teacher-pupil relationship in the educational environment.

**Postsecondary education** – education focused on adult learners and education beyond graduation from secondary schooling institutions.

**PSEO** – Post Secondary Enrollment Option; a program offered by the Minnesota Department of Education for attending MnSCU colleges in lieu of traditional high school for eligible juniors and seniors in the top third of their class and obtaining 70th percentile average scores on the ACT or SAT.

**Secondary education** – the education system for youth or children that focusses on primary schooling through graduation of high school.

**Sociodemographic** – pertaining to or a group characterized by a combination of sociological and demographic characteristics, such as romantic partners, families, schools, clubs, associations, friends, networks, teams, and their characteristics.

**State College** – a degree conferring postsecondary education institution within the MnSCU system of colleges that focusses on 2- and 4-year degree seeking students.

**Student** – an enrolled part-time or full-time student taking coursework for credit at any of the 31 MnSCU system colleges—this does not include trainees sent by employers for noncredit seminars or workshops, this does include minors enrolled and pursuing PSEO for college credit courses.

**Technical College** – a postsecondary education institution within the MnSCU system of career and technical colleges that focusses on students seeking occupational credential and vocational certifications.

**Vocational Education** – education in the pursuit of a specific occupation or technical field; most students focus on certification up to and including 2-year degree attainment.

### **Perspective and Paradigm of the Researcher**

A thought occurred to me: half of the education of American adults is being overlooked and dismissed. What was really jarring was that it was being relegated to a second class standing within my own department by me and my academic peers. I knew then what topic I was going to hone in on for education research, namely, vocational education in America. Parallel to typical higher education research, not because vocational education has ever had equal stature as traditional liberal education in the postsecondary education realm, but parallel because it evolved in the same contextual

factors of American Society. I was passionate about research in my area of education, but had never studied it beyond the elements of quantitative analysis and literature reviews. Peers in my department saw their research in education through content and contextual lenses; I stumbled upon what my studies were lacking—balance. I found the complement, the balance that I had been missing, was a critical educational perspective to conduct research and see the contextual side of vocational education. It became apparent to me that two overarching domains of education for adults exist, with two overarching complementary areas in which decisions pertaining to education are made: content and context.

Although I align with a post-positivistic and pragmatist perspective, it is not precisely as described by Creswell (2012). I do not view pragmatism as the paradigm. Post-positivism to me is the paradigm or overarching worldview that no person can ever absolutely prove or disprove anything. Instead, I view pragmatism as my self-selected philosophic perspective aligned with the beliefs of Dewey and Grubb, with a postmodern slant. Pragmatism has been a tradition of many academics in the education field, and what makes it postmodern is that I see my field also with the modernity of critical pedagogical stance that informs my area of androgogical research in vocational education (Denzin & Lincoln, 2011, p. 167). I view class and socioeconomic status as precursors to any other critical research perspectives, partially because I have lived experience with those far more than feminist or racial critical genres.

Critical class and critical educational stances feel accessible and are actionable antecedents in my research. As a career military officer, rurally raised child of a farm hand, and lifelong technically educated soldier, the sting of social class stigmatization between the university class and vocational education class of Minnesotans has been a

pervasive lifelong undercurrent in my academic and professional lives. It is my lived experience that motivates and intrinsically drives my studies to keep after the unheralded research of career and technical education. My family and I were the neglected majority that Parnell (1985) spoke of decades ago. At my rural elementary schools, there was no media arts teacher or language immersion track. At my rural high school, students commuted from four farming communities to have the tax base to keep the doors open on a 100-year-old school building.

Some of the students, including myself, received every version of assistance that the social programs in Minnesota provided: free school lunch, sponsorships to join classmates on extracurricular activities, heating assistance at home, and food assistance from the county. In the 1980s, just being part of the farming industry was a one-way ticket to poverty and second class citizen standing in rural Minnesota. The farm hands work alongside migrant workers to pick the rocks, spray the beans, and bail the hay of the farmers' fields for minimum wage, but more often than not, cash at the end of an exhausting day. It was a tough upbringing, filled with farm chores before and after school, schools that met the minimum standards for curriculum and facilities mandated by the state, and little of the promise for a bright future like the seemingly affluent city students. The commercials on TV and radio advertised for schools that farm families could never afford to send their children to but were expected to attend if they wanted the jobs that were considered professional. But, the technical and community colleges were obtainable and a way to achieve an occupation other than the manual labor of farm work. The fastest exit from the farming lifestyle was joining the military and going away to college in the city.

Having left the farm labor lifestyle it is only now, more than 20 years later, that I am looking back on the sociodemographic factors at play in my own homophily to inform my research on a similarly situated postsecondary constituency that resides in Minnesota. Such contextual influencers for me cannot be filtered out in research involving human subjects; therefore, a pragmatic, postmodern, critical educational philosophical perspective guided me epistemologically in this study. This dissertation was written with the dual priori of analyzing the Minnesota CTE educational system metadata for both content and context in seeking research insights regarding the influence factors of home related to college choices.

Liberal or classical education tends to pertain to a traditional class and instructor relationship that holds epistemologically to the ideal of knowledge for knowledge sake, or going to school to learn, as with pedagogy. Vocational and technical education tends to champion nontraditional class, with tacit and experiential content, and instruction centered on the premise that knowledge is passed on to others and is manifested in skill and application, as in andragogy. Kvale (1996) stated, “With the breakdown of universal meta-narratives of legitimation . . . there is an emphasis on . . . the context, on the social . . . reality where knowledge is validated through practice” (Kvale, 1996, p. 42). For me, in the vocational education research discipline, this is the essence of the epistemological standing of my field—that knowledge is validated through praxis. In the liberal arts educational sphere, academics and students discuss theories and concepts, whereas in CTE, learning by doing is a hallmark of the curriculum, not an aspirational practice left for post degree attainment.

Vocational education is an educational context where learning is intrinsically linked to who is acquiring what skills in what cohort with other learners in order to make

one's way in the world. At certain junctures in the lived experience of most adults, the need for subsistence is larger than the need for knowledge for the sake of knowledge. Adult learners do not learn the same ways as children, and need alternative methods to attain education for work. In the legacy of faculty from my chosen department, names including Copa and Lewis loom large in the body of journal articles regarding the pressing need for more technical education and equitable funding to publicly enable this educational conduit to success as a state and nation.

### **Rationale for the Study**

This need to educate for the betterment of society led me to vocational education research and narrowed the design and methods employed to attain results. Researchers have paid little attention to the reasons why adults choose vocational education when the employment needs are so significant in all 57 states and territories and across all industries. The insights that could be gained from a prematriculation study into the vocational education system would be significant if researchers established the true reasons that learners chose this educational route. Concurrently, the research is scant regarding the vocational educational matriculation influences, but the paucity of research that goes beyond mere content and quantitative factors, such as tuition, is almost nonexistent. Therefore, I was left with the conundrum regarding how to approach the research question from a more holistic approach, and to begin to answer why students select vocational education using exit survey of how or what led students to choose certain CTE institutions.

Because every vocational education system is unique to its state or territory, a national or regional level comparison of CTE systems was problematic. Conducting within state system CTE research could provide a reenergized start to macro-level

analysis within the CTE field. A start point for research within a state system may include an analysis of pre-matriculation and applicant sociodemographic data. These datasets could provide much needed insights regarding the reasons adult learners choose MnSCU community and technical colleges to attain credentials and degrees. A longitudinal analysis could provide insights into pre-matriculation choices over time to measure consistency of selection of CTE as the postsecondary educational option of choice. With more than 400,000 Minnesotans pursuing postsecondary education annually in MnSCU institutions, the data points for analysis were copious.

The Minnesota system of career and technical colleges and the former national level CTE research center both resided in Minnesota. Having professional contacts in the MnSCU system offers a means to garner important insights beyond the rather dated journal pieces on American vocational education written primarily in the 1990s or earlier. American CTE is a patchwork of educational institutions that organically arose at disparate times, in disparate regions, under the guidance of multiple government agencies at state and federal levels, and lacking the organizational structure and standardization of a unified whole. Hence, I focused beyond the dissonance of the national level to the macro level to hone the focus to a single discernible, coherent state CTE system, namely MnSCU.

Researchers have paid little attention to the reasons why adults choose CTE when the educational needs are so pressing in all states and territories and across all workforce sectors. However, the insights gained for matriculation into the vocational education system could be significant if researchers determine the true reasons learners chose vocational school. Concurrently, research is minimal regarding the vocational educational matriculation reasons, and the paucity of research that goes beyond mere cost

or other quantitative factors is almost nonexistent. Therefore, I answered the research question from a more holistic approach to begin to answer why students select vocational education instead of the common queries by survey of what led students to choose education institutions. To garner deeper insights into why systematic decisions were made, I used inferential statistical analysis at the pre-matriculation juncture.

My dissertation research methodologically was to build a quantitative correlation study based on research from the MnSCU systems office archives. I sought to analyze unique aggregate descriptive and inferential data to determine how and what influences MnSCU applicants to attend community and technical colleges. From a social justice perspective, I sought to rebalance the funding of CTE, by conducting quantitative research of archived datasets bolstered with comprehensive macro-level data of Minnesota applicant data during the last 2 decades. If funding for CTE in Minnesota is primarily via one large legislative appropriation then parsed out via formula, then in future biennial budgetary cycles, this elected body will need to be informed by evidence that funding is lopsided and that dire need exists for funding to be projected to meet the demands in the CTE domain of higher education in Minnesota.

Compelled to fill the dearth of research into Minnesota CTE and assembling a recent body of research to make the argument for increased CTE funding, I proposed two primary research questions with two distinct research methodologies. First, a dearth of CTE research exists, as evidenced by a search in Academic Premier that returned only 3 journal articles that have MnSCU in the body of the writing, none of which were within the last 12 years, were longitudinal studies, or referred to CTE at the higher education level. A Google Scholar search produced scant results, with seven total results and four as journal articles with MnSCU included in the body of the writing. MnSCU is the fifth



largest CTE system in the United States. In addition, the attribution of the MnSCU System Office leadership attested they have not received a query or request for research from academia in more than a decade. This brought me as a researcher to a distinct decision of methodology—to conduct broad research at the system level or pursue precise research questions to gain insights focused on a highly detailed archived dataset. I chose the former to make the state level argument for rebalancing of higher education funding between two distinct domains Minnesota.

### **Research Questions**

1. How strong is the influence of applicants homophily on the choice of MnSCU college for their postsecondary education?

2. Are sociodemographic based influencers related to the choice of a MnSCU institution?

If academic researchers knew more about CTE matriculation, then it could become the baseline for additional longitudinal studies in program commitment and completion rates, which relates to career progression and workplace success. Proceeding with research regarding the contextual factors was the basis of my study with a focus on the influence of an applicant's homophily on their postsecondary educational choices. Although esoteric, homophily (see Definitions) is a key sociologic principle that may be behind the decision-making of many community and technical college bound attendees. The first researchers to utilize homophily, or the sociological phenomena in which people tend to associate with and gravitate toward others who are similar, emerged in the 1950s. Lazarsfeld and Merton (1954) studied the formulation of two types of homophily: value or status based homophily. The researchers described it as, "one of the most striking and robust empirical regularities of social life" (Lazarsfeld & Merton, 1954). Since the 1950s,

other sociologists expanded the typology of homophily to include categories of age, race, gender, and religion. However, McPherson, Smith-Lovin, and Cook (1987, 2001) related one's family of origin to the homophilies of education, occupation, and social class. I utilized McPherson's et al.'s sociological principle as the theoretical premise of my research—that applicant decisions of college choice among the 31 MnSCU colleges was influenced by their homophily.

## Chapter 2: Literature Review in CTE

It has been 33 years since the most significant education reform occurred at the national level in the United States. On April 26th, 1983, the task force appointed by U.S. Secretary of Education Bell released, *A Nation At Risk* (Stone, Kowske, & Alfeld, 2004; DOE OVAE Vocational-Technical Education: Major Reforms and Debates 1917 - Present, 1993). Although this documents contains more than 60 pages that summarize the systemic failures of secondary education in the United States, this report also served as the spark for vocational education reforms. The report reenergized the debate regarding the importance of transitioning a growing, otherwise uncredentialed, workforce to vocational education for increased global competitiveness (Stone et al., 2004, Gray, 1988, Dirks, 1998). The report added urgency to the need for multiple paths to an educated workforce, which vocational education has historically provided in tandem with the growth of technological work worldwide. In addition, the report served as the impetus to attain multiple gains in expanded vocational education by the amended Carl D. Perkins Vocational Education Act of 1984 (Stone et al., 2004; Threeton, 2007, Barlow, 1990).

Despite the impassioned call to action in 1983, a subsequent report from the DOE showed few educational changes or policy implementations suggested had been completed 25 years later. *A Nation Accountable: 25 Years After A Nation at Risk* (U.S. DOE, 2008) outlines the stagnation of suggested policy implementations from a quarter century prior and a worrisome declining rate of secondary school graduation rates. From a human resource development (HRD) perspective, secondary school graduates are the workforce of each generation. Without a strong educational baseline, the American workforce will continue to struggle to fill the hundreds of occupations in need of dual

academic and technical cognitive competence. The HRD field and vocational education at all levels are inextricably linked because of reliance on this same pipeline for America's workforce (Kuchinke, 2002).

Although the clarion calls for change in educational attainment, career pathways and stratification began with an upsurge of funding and policy initiatives in the late 1980s, and the momentum for multiple educational reforms has dwindled. From the push for improvements in the technical education system by way of the amendments to the Carl Perkins Vocational and Applied Technology Act of 1990, the initial spate of funding and programs which had started off with a concerted effort from the federal level down to the 57 states and territories, tapered off dramatically by the close of the decade. Those efforts and initiatives included incorporating best practices from the German Vocational Education Training (VET) System. Just a few of these vocational education initiatives that started in this timeframe included introduction of CTE, career pathways, secondary-postsecondary articulation, dual enrollment, career academies, tech prep, and renewed emphasis on apprenticeship and work-based learning (Stone et al., 2004).

Moving U.S. vocational education toward best practices was and remains challenging because of incongruence between the state systems and underrepresentation of CTE in higher education academia. Potential tenets used for analyzing the U.S. CTE system are (a) government educational policy, (b) educational system structure, (c) unions or labor, (d) private industry, and (e) social standing with stakeholders. Many authors and much of the published work pertaining to educational systems focus on national level policy and structure with regard to educational systems in comparative studies. Previous national CTE leaders, researchers, and writers in the CTE field, including Grubb, Bragg, Copa, Lewis, and Clarke and Winch, have written extensively

on the need for educational systems to be rebalanced to meet all stakeholder requirements instead of stilted toward general academic studies (Bragg, 2001; Copa, 1988; Grubb, 1991; Lewis, 2007; Clarke & Winch, 2007, Kahlenberg, 2015).

Whereas the German and other educational systems are marked by duality, the American educational system is more linear with the unitary secondary schooling followed by a bifurcated higher education stratum. Structurally, the U.S. system for education could be appropriately labeled as decentralized, market driven, or contestation based. Overall U.S. federal spending on education has declined since 1973 and was 4.85% of GDP in 2001 (Carpentier, 2006). Education is the jurisdiction of the 57 states and territories with the locus of control with local school districts (Rieble-Aubourg, 1996). Unlike the postsecondary education that tends to be a highly stratified educational system, virtually all U.S. secondary schools offer a similar liberal education curricula and award a single completion credential—a diploma (Deissinger, 2004; Kerckhoff, 2001).

Figure 1 displays a depiction of the U.S. educational system.

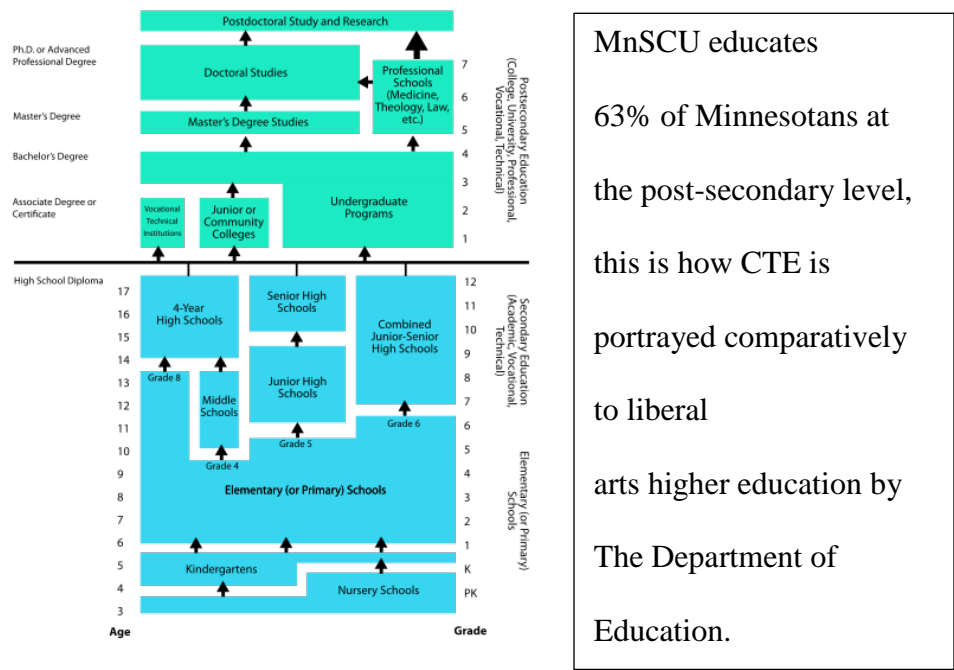


Figure 1. The U.S. education system: Secondary and postsecondary. Retrieved from www.Ed.gov.

Postsecondary education can be typified as bifurcated into two simplified genres, higher education and CTE. The U.S. VET name was codified into law for U.S. vocational education since the passage of the Carl D. Perkins CTE Improvement Act of 2006 (Threeton, 2007). The name conversion was already in use at the turn of the 21st century and adopted formally by the AVERA in 2004 to Association of Career and Technical Education (Kotrlík, 2004). Higher education in the United States often is presumed to be university level education in pursuit of a baccalaureate degree. Entrance to higher education institutions in the U.S. often require no credentials, educational assessment, or qualification beyond the diploma conferred at completion of secondary school and a generic one-time SAT or ACT test score. Federal level funding of universities much, like education funding overall, has declined steadily since 1973 and in 2001 accounted for only 37% of funding (Carpentier, 2006). To offset higher education costs, U.S. colleges and universities charge substantial tuition and fees, again harkening to the typology of market driven education; if affluent, the choices are abundant, and if socioeconomically underprivileged, the choices become limited.

The parallel higher education system to universities is CTE. These institutions, by definition, focus on education for careers as defined by the Carl D. Perkins CTE Improvement Act of 2006 (PL 109-270):

Organized educational activities that offer a sequence of courses that provides individuals with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in current or emerging professions; provides technical skill proficient, and industry recognized credential, a certificate, or an associate degree . . . and include competency-based applied learning that

contributes to the academic knowledge, higher-order reasoning and problems-solving skills, work attitudes, general employability skills, technical skills, and occupation specific skills, and knowledge of all aspects of an industry, including entrepreneurship, of an individual. (Ed.gov/OVAE; Threton, 2007)

At the federal level, U.S. vocational education is renewed statutorily by amending the Vocational Education Act approximately every 6 years. This renewed law provides \$1.28B in federal funding parsed out to 57 states and territories by way of a demographically based formula. Monies are tied to accountability and reporting requirements for funds utilization and general programmatic guidelines on CTE areas of emphasis for the 6-year renewal period (Ed.gov/offices/OVAE/CTE; DOE, 1993; Techniques, 2002). The federal level office that oversees policy and compliance with regulatory stipulations tied to funding is the U.S. DOE OVAE. The federal level oversight of apprenticeship and unions is aligned under the Department of Labor in two distinct subdivisions: the Employment and Training Division and the Bureau of Labor Statistics, respectively (Ed.gov/offices/OVAE; doleta.gov; bls.gov). The law governing the use of apprentices in the 23 states and four territories that the Department of Labor oversees emanates from the National Apprenticeship Act of 1937 (doleta.gov).

At state level exists the preponderance of funding, regulation, and programmatic guidance regarding American vocational education. To call U.S. vocational education a *system* is a misnomer. No federal regulation or law stipulates any centralized vocational education system structure mandated in each state to offer at the initial or continuing education levels of CTE. A more accurate portrayal would be an organic set of technical and community colleges that have evolved with the funding and requirements of the states in which they reside. Vocational education is unique to each state and often

regionally or locally market driven. In addition, CTE in the United States is so locally driven that credits might not transfer between community colleges and technical colleges within state systems. The calculation for the 57 states and territories that receive federal Carl D. Perkins Act funds creates another disparity in dollars disbursed, with smaller states near \$5M and larger states near \$100M in 2007 (Ed.gov/OVAE/CTE). The funding is not disbursed based on educational or industry workforce needs assessment, but instead is purely benchmarked on demographic size of state population.

Conducting comparative analysis of the U.S. national level CTE is nearly impossible with no standardized CTE system model that traverses the states. Longitudinal studies that involve a comparison of state CTE structures are limited, with the lone national CTE research center in the midst of discontinuance of funding and pending closure. State CTE systems offices are staffed to administratively manage the CTE institutions in their purview and are beholden to report to the state legislatures, which are the source of the vast majority of CTE funding. Often without the benefit of substantial endowments and monetary gifts from benefactors and alumni, as with the university system, CTE systems tend not to spend taxpayer monies on research viewed as otiose by education subcommittees of state government. The national average expenditure at 2-year institutions was \$11,000 per full-time equivalent student, whereas at 4-year institutions the national average was \$46,000 per full-time equivalent student in 2010 (NCES.ed.gov, 2010).

Few generalizations across American CTE can be made in terms of educational types, funding, and outcomes. Nearly all CTE systems are workforce entrance oriented with each entrant who successfully leaves CTE programs attaining a credential, certificate, qualification, or associate degree (DOE, 1993; Stumpf, 2007). The CTE



systems of the states tend to be 1- to 2-year educational programs. The vocational education systems tend to have distinct technical colleges and community colleges within their structure. Credentials tend to be conferred as certificate programs or 2-year degrees with accreditation at the state or regional level. CTE system administration officials engage in strategic alliances with state and local enterprises to enable school-to-work and training with industry arrangements directly (Stumpf, 2007). In addition, U.S. CTE private industry partnership agreements are not usually guided or regulated from a local government or union office. CTE systems from state to state have disparate program offerings, disparate curricula, nonstandardized credentials, and nonequivalent credit granted across programs. No national qualification framework is in place to enable or direct such standardization of CTE in the United States. Overall American vocational education systems are categorized structurally as decentralized, market driven, state level locus of control, and bifurcated from the parallel system of higher education, namely the university system. The United States is unlike the European system of CTE, which has defined qualifications and standards that transfer from province to province and across national boundaries in the European Union.

Sociodemographic generalizations about CTE students reflect national trends, such as being more likely to come from depressed socioeconomic backgrounds, older adults, and returning adult students. CTE students, who were still dependent, tend to live in lower income households; 21.2% of CTE dependent students in a 2004 national study were from households with incomes below \$20,000 per year (DOE National Assessment of Vocational Education, 2004; Palmer & Gaunt, 2007). Among the national trends are the increased likelihood of CTE students to be older with 34.2% of all CTE students being 30 years of age or older in 2004. Of 2-year institution students, 50.8% choose a

vocational education major and just more than a third of all CTE enrollees nationwide have already earned a postsecondary degree or credential (NCES, 2014; Palmer & Gaunt, 2007; Visger, 2007).

The 150-year history of the Minnesota public higher education represents a microcosm of the maturation and change since early iterations of the Vocational Education Act in the United States. In 1945, the Minnesota Legislature passed the Area Vocational-Technical School Enabling law to formally establish and fund public vocational education in the state. The Minnesota area vocational technical institutes started with a single school at Kline Garage in Mankato in 1947 with six programs: communications, electronics, electrical machinery, machine shop, tool and die, and internal combustion engines (MnSCU, 1995). The first principal, Harold Ostrem, was a natural choice because of his years of experience with technical schooling during World War II with Signal Corps soldiers bound for the warfront. Area Vocational Technical Institutes (AVTIs) sprang up across the state to meet unmet educational needs of the postwar era.

At the federal level, the Vocational Education Act of 1963, and subsequent amendments to the Act through the 1976 Vocational Education Act reauthorization began to dramatically change and affect state vocational and technical systems. At the national level, a profound jump in enrollment was seen nationwide as the VEA of 1963 monies enabled U.S. vocational education to almost double from 7.5M to 13.5M students in just the 4-year span from 1968 to 1974 (Barlow, 1976). At the federal level, the laws passed in the civil rights era in conjunction with President Johnson's War on Poverty began to add contextual stipulations for accountability with the receipt of federal monies for vocational education to the states (Barlow, 1967; DOE, 1993; MnSCU, 1995). In

Minnesota, the changes to monies set-aside for federally directed purposes, accountability reporting, and administrative requirements equated to a shift away from education for all and toward expectations of tuition payment. Stipulations in the VEA Act of 1963 and its subsequent amendments mandated that states receiving federal funds had to direct monies toward select efforts for underprivileged, dropouts, and disabled populations, while simultaneously requiring statistical reporting on prescribed set-aside utilization (DOE, 1993).

The dual burdens of incongruent state and federal reporting, coupled with initiatives in the state legislature to shift the burden from public funding to student tuition, meant large administration increases to the MN Technical College System (1995). The shift away from full public funding was a point of divergence from past practices in 1977 and has only burgeoned since in Minnesota (Jacob & Weiss, 2010). By 1984, 25% of costs were paid by way of tuition from the 36,000 enrollees and 75% was through legislature appropriation (MnSCU, 1995). For more than a decade, the cost burden to students remained stable, but a rapid decline in Minnesota public funding of MnSCU began in 2000. This rapid funding decline put the CTE system of MnSCU on a path from education for all to courses, fees, and tuition increases that led to it being in the 90th percentile for cost burden to students by 2012, among all CTE state systems.

A seismic shift in Minnesota vocational education at this point was away from programs of study leading to certification or credentials, to a redesign of CTE programs with courses that accrue credit transitioning into the 1990s (MnSCU, 1995). As the MnSCU system level directors framed it, “the casualty of conversion [to credits] was education for all,” credits were based on academic rigor that was a structural element of university education (Simser, Dryer, & Frantz, 2013). The downside of this conversion

was that the paradigmatic shift to courses based on credit was screening a subset of learners out of Minnesota's vocational education system. The precise group of socioeconomically underprivileged, adult learners with no higher education credits, persons with disabilities, drop outs, and educationally marginalized students were those who the Vocational Education Acts of 1963 through 1976 mandated the states to direct their focus on (Grubb, 1991). Instead of the education for all, predilections for AVTIs in the 1940s through mid-1970s where students entered a program and, if successfully completed, were granted a credential, tuition began to be charged at increasing rates and evinced the dual barriers of courses for credit attainment.

For as much vociferation and calls to educational action were sounded after the passage of the Perkins Acts of 1984 and 1990, the resourcing and educational reform momentum was short lived in the states. A jump in the number of technical college campuses across Minnesota from 28 to 34 followed the infusion of federal funds in the years following the law's enactment. The enrollment within the newly renamed MN Technical College System rose with the additional facilities moving through the 1990s (MnSCU, 1995). Other initiatives that swept into Minnesota's 34 technical college campuses included a newly accredited Applied Associate (AAS) degree, Tech Prep programs, emphasis on career counseling, and a push for articulation agreements with the state colleges to include more general education credits. Even with cyclic lobbying at the national level with each administration, commitment down to the state level only lasted a few years.

Between 1990 and 1995, the MN Technical College System shifted to the final form that it is structured in the 21st century as MnSCU, but not without political and structural machinations. By 1990, the MnSCU enrollments had surpassed 41,000 on the

34 campuses of the state (MnSCU, 1995). The legislature took dual measures to change both the educational and leadership landscape of MnSCU in 1990. Passage of the Higher Education Board laws and the simultaneous hire of a new out-state system chancellor were harbingers of changes on the horizon. The 1991 Higher Education Board laws merged the Minnesota State University System with the Minnesota Community College and Technical College systems, implemented on July 1st, 1995. This assimilation of the vocational education system of Minnesota meant enduring a difficult and, at times, unwanted acculturation into a liberal arts university centric paradigm of higher education. To Minnesota vocational and technical educators of the time, merging into a system of 2-year and 4-year degree producing state colleges was deemed a mismatch from the start. Little contestation could be mustered against the pending system changes in the mid-1990s with the declining federal funding and the majority of funding from state legislative appropriations.

At the time of the merger, Dr. George Copa was leading the NCRVE in an effort to assist CTE nationally with the conversion and assimilation into higher education with the approaching century. Copa, as others had before, cautioned CTE educators and administrators to analyze the design of the 7,638 postsecondary institutions in the United States in 1994 and ensure the fit of technical education into the educational landscape of the 1,534 public institutions (Copa & Ammentorp, 1997). Technical institutions saw resource reductions, shifts to the *knowledge economy*, and a parallel push for postsecondary education needed for all moving toward the year 2000 (Pucel, DeVogel, & Persico, 1988, Copa et al, 1985). The predictions at the national level would soon come to pass in the state with close of the decade and century.

MnSCU and the state of Minnesota technical education is inundated in the 21st-century. The 31 schools and colleges on 54 distinct campuses are awash in enrollees, with more than 400,000 credit and noncredit students a year in 3,900 educational programs (MnSCU, 2010). MnSCU is now the fifth largest system of colleges and state universities in the nation, with 34,700 graduates per year, career education to 6,000 employers and 179,500 employees each year, and educating 63% of Minnesota undergraduates (MnSCU, 2010). By way of comparison, the UMN has five campuses and 53,000 students with a biennium funding request to the legislature that is essentially equivalent to the MnSCU System of \$1.5B for fiscal year 2013, with average tuition at MnSCU colleges at \$4,815 for 2013, and the UMN at \$12,060 (MnSCU.edu/media/newsreleases). MnSCU state appropriations peaked in 2008 and have not recovered from 2005 levels; since 2000, MnSCU state funding has declined 45% (MnSCU, 2012).

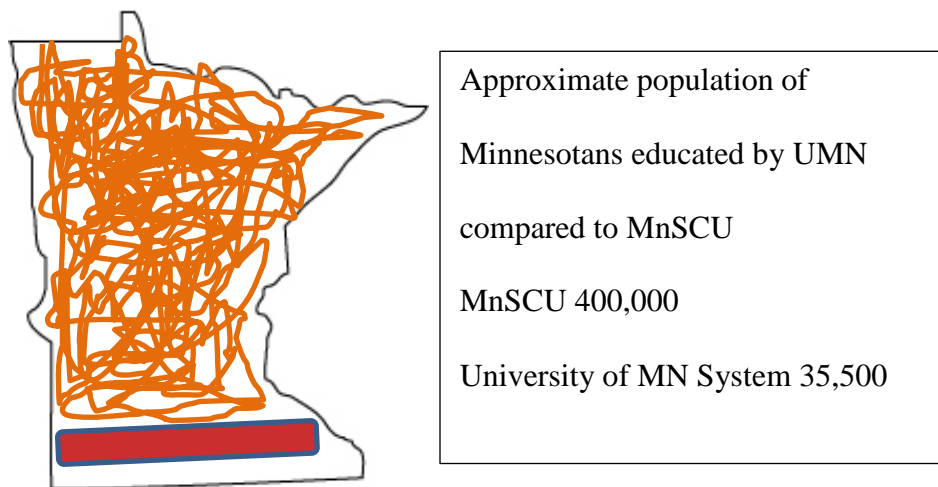


Figure 2. Minnesotans Educated by MnSCU Educated by UMN.

The MnSCU system is inundated with requests from employers for training programs to upskill employees, with 10 times the student enrollment from 1990, annual reporting requirements for accountability to state and federal levels, and dual obligations

to tackle school drop-outs at both types secondary and postsecondary levels. Although 70% of Minnesota high school graduates are bound for college the next fall, nearly 50% do not complete the first year of college. In keeping with the MnSCU mission statement established by the State Board of Vocational Technical education in 1983, conspicuously timed with *A Nation at Risk* release, “Vocational technical education shall be provided in occupations in all fields and levels other than those requiring a baccalaureate degree. All Minnesota people who need, want, and can benefit shall be assured lifelong equal access to vocational technical education” (MnSCU, 1995, Wallace, 1998). MnSCU has maintained the minimum entrance criteria for enrollment as holding a high school diploma or GED.

To meet the needs of a burgeoning student population and declining funding, MnSCU has become increasingly reliant on technological instruction and administration platforms as well as partnerships to conduct fundraising. Much like the public-private grants and benefactor partnerships that arose out of need in the K–12 system in Minnesota, estimated at 3.1% of total funding as of 2010 (NCES.ed.gov, 2010). MnSCU has also resorted to grants and benefactor partnerships to prevent system indigence in the declining funding era of the last decade. Perkins Act federal monies are diminutive, representing only 16% of the MnSCU budget. The use of Act funding is restricted and many states, including Minnesota, use these funds toward remedial instruction for disadvantaged students and equipment purchases. In Minnesota, Federal Perkins Act funds are a single digit percentage of the postsecondary budget, and funds must be split between secondary and postsecondary institutions to comply with federal guidelines (Simser, Dryer, & Frantz, 2013). According to the MnSCU system level directors,

Perkins money is utilized differently from state to state, some states choosing to solely allocate the funds to secondary level CTE.

With the removal of federal funding for the best practices programs, such as Tech Prep in 2011, and the 2 decades long push for integration of general education into vocational education curricula by way of credit coursework, private partnering has become a necessary means to fill the funding gap. With a lack of federal funding to MnSCU, the focus has turned to private partnership. In 2010, MnSCU had a total annual operating budget of \$1.2B, and of that total, state appropriation were \$605M, tuition accounted for \$777M, and other sources totaled \$462M (MnSCU, 2010, Nobles, 2010). In the 2012 report to the legislature, other source funding jumped again with a federal level assessment that pegged MnSCU tuition in the 90th percentile nationally of technical and community colleges (MnSCU, 2012).

Contextually, the landscape has become more diverse and more bifurcated since the Carl D. Perkins Vocational and Applied Technology Act of 1990. Little has changed from the social assessment of the 1993 DOE OVAE Report (Billet, 2014) regarding the state of technical education as,

bearing the almost full burden of social uplift . . . with the vocational educator who wondered why it was only the vocational programs which were to be held accountable for successful education of the most difficult-to-educate youth of the country. (DOE, 1993).

In 2010, MnSCU served more students of color than any other higher education institution in the state, representing more than 47,000 or 17.6% of enrollments, while maintaining an open admissions policy in the system (MnSCU, 2010). Underrepresented students jumped 34% from 2008 to 2011, including underprivileged groups: students of



color, first generation postsecondary school attendees, and low income students (MnSCU, 2012). With stagnant graduation rates in Minnesota, secondary schools in the CTE system will undoubtedly continue to be saddled with both the onus for the remedial educational gap and absorbing the increasing numbers of university fail outs and drop outs, despite decreased resources and increased enrollment.

As alluded to previously, the social acceptance or expectation for graduates to go on to college continues to rise as the slope of that ascent increases. Although mentioned rarely in academic journal writing, and even less prevalent in the last 2 decades, is the looming but unaddressed impediment of the social stigmatization of vocational education in America. In his comprehensive *History of Industrial Education in the United States*, Dr. Barlow in 1967 as the Historian for the American Vocational Association summarized this stigmatization: “emphasis on glamour aspects of education leading to college entrance and, in effect, endorsed trends already observed in American education to classify all other educational courses as a shade lower in dignity than the academic course” (p. 440). In an online search of both the DOE Office of Vocational and Adult Education and the ACTER, the word *stigma* only appeared once, in a quote from former President Nixon from 1970 on vocational education. In his 1985 book on the need for community and technical colleges, Parnell (1985) described this stigma as leaving the neglected majority of students feeling like failures if they do not aspire to obtain a baccalaureate degree. Anything less than a baccalaureate was viewed as “second rate” (Parnell, 1985, p. 8). Although an important aspect of the contextual barriers to student and administrator success in CTE colleges or state level systems, stigma remains as taboo in academic writings as in decades prior. The challenges faced by CTE are as prevalent today as they were outlined in the 1963 Vocational Education Act and the 1983 DOE

Report *A Nation at Risk*. What has changed in the 2 decades since the MnSCU system was codified into Minnesota law is the near absence of research into CTE as a branch of higher education and the need for renewed emphasis on the majority of Minnesotans who rely on this path of adult education for work.

### **Chapter 3: Methodology**

This chapter represents the juncture between the unearthed history of technical education in Minnesota, the intent of the CTE study on MnSCU applicants, and the praxis of how I conducted the research. The overarching research questions of the study were,

1. How strong is the influence of applicants' homophily on the choice of MnSCU college for their postsecondary education?

2. Are sociodemographic based influencers related to the choice of a MnSCU institution?

The dataset was a unique query of the MnSCU archived database, which obtained the source information on all CTE applicants in the academic year chosen for the study, 2013. This educational research involved archived data, stripped of all personally identifiable applicant information, and assembled as an empirical study with three distinct statistical tests for the correlation of applicant homophily and the influence on educational choices among 30 MnSCU technical and community colleges.

#### **Data Sources**

Data for this study were drawn from the Minnesota State Colleges and Universities archived applicant data files from 2003, 2008, and 2013 academic years. Although data files on the MnSCU website are searchable, downloadable, and public domain, the archived applicant files had to be obtained via unique database query. The database query involved proprietary information belonging to MnSCU, which required a formal agreement stipulating terms of usage and nonproliferation be signed.

I purchased the applicant dataset with personal funds and source data were never transmitted via disc, electronic mail, cloud based software, or any other networked digital medium. The raw dataset was purchased in August of 2015 and resides on a non-

networked external hard drive. Only coded data were manipulated in third party propriety software on a stand-alone computer utilizing Statistics Standard Grad package SPSS by IBM, and Intellectus Statistics (2017).

The MnSCU universal application is the source document and instrument used for all data points queried by MnSCU analysts for inclusion in the dataset. The MnSCU universal application has been in use for 18 years with only minor revisions during the last 2 decades. Appendix C includes the desired areas of information regarding home address, parental educational attainment level, educational intent, intended college, and demographic data.

No personally identifiable information was included in the MnSCU database query. Prudence was shown by not including names, social security numbers, or other personally identifiable information in the dataset. The only unique identifying information included were the applicants randomly assigned MnSCU applicant numbers. However, these applicant numbers were neither utilized in the analysis phase nor tested case-wise in the statistical programs used (SPSS, Intellectus). The Institutional Review Board (IRB) concluded this study was classified as exempt because of the archived dataset along with the constraints for data utilization in the MnSCU User Agreement (see Appendix B).

### **Methodology: Terms and Usage**

**Descriptive statistics.** I used descriptive statistics to empirically describe and explore main characteristics of the five study variables. The five variables in the study were: parental educational attainment, proximity in miles from home to college, metro or outstate college of choice, applicant educational intent, applicant gender, and applicant diversity.

**Spearman correlation.** Spearman correlations examine the strength of the relationship between two variables that are at least ordinal in level and range from -1 and +1. I included Spearman correlation tests because the dataset was highly skewed and not normalized. Correlations tested both the one scalar variable of proximity from home to college and the strength of the relationship to these three nominal dichotomous variables: metro or outstate college of choice, applicant gender, and applicant diversity.

**Kruskal Wallis.** A Kruskal Wallis test was run three times and used to assess for differences in the scalar dependent variable by each nominal independent variable. When significance was found, I conducted pairwise comparisons to determine the group differences. This nonparametric test was a quality control and quality assurance check on the Spearman's rho correlations tested with the SPSS software. I conducted the Kruskal Wallis tests in a dissimilar statistical program, Intellectus Statistics software, utilizing the exact same coded dataset. All three Kruskal Wallis nonparametric tests confirmed the results garnered by the three Spearman rho correlations. Appendix D includes the full results of each test along with the software platforms.

### **Variables Collected From the MnSCU Universal Application Data**

The following five variables were culled from the data collected from MnSCU applications for academic year 2013. I chose the five variables because each has a direct linkage to the applicant's homophily. The applicant's home address, parental education levels, gender, racial heritage, and ethnicity are all sociodemographic factors that potentially influenced the applicant's college decision and educational credential or degree aspirations.

**Parental educational attainment variable.** This ordinal variable had five categories from no high school diploma through bachelors or higher degree listed on the

MnSCU Universal Application, the parents or guardians of applicants were within the homophily, and affected applicant decisions.

**Applicant educational intent variable.** Ordinal variable with six levels of educational attainment designated on the MnSCU Universal Application from complete coursework through earn a bachelor's degree. Choices of educational aspirations for credentials or degrees and colleges are influenced by those in the homophily of the applicants, friends, family, clergy, educators, and others they chose to identify with influence decisions.

**Proximity variable.** This scalar variable is calculated in miles from applicant home of record to college of choice on the MnSCU Universal Application, dependent empirical variable in the study, applicant decisions about how close to home or how far they are willing to go to MnSCU colleges might have been influenced by their homophily.

**Gender.** This nominal categorical variable had two answers applicants could self-select on the MnSCU Universal Application, male or female, regarding how applicants demographically identify by gender, which may affect college decisions.

**Diversity.** Nominal variable with six answers applicants could self-select on the MnSCU Universal Application. Participants choose from Hispanic heritage or five racial categories, and the ways applicants self-identify according to race, ethnicity, and cultural heritage may affect college decisions.

**Dummy coded variables.** These variables are coded at a 0 or 1 to the three study nominal variables to assign a mathematical value to non-empirical terms. In this study, dummy coding was used with gender, diversity, and outstate or metro variables for nonparametric statistical testing.

**Collapsed variables.** This variable is a technique used to code the nominal variables with several categories that consolidated each into dichotomous categories to maximize the utility of the variable in a statistical test. In this study, the categorical variables of diversity, educational intent, parental educational attainment, and outstate or metro were collapsed from several categories into two.

### **Data Limitations**

**Application as a proxy for a unique survey.** Although the MnSCU universal application was designed as an administrative document to track and sort potential enrollees to the state colleges and universities, this document also includes highly useful survey information about cohorts of potential students. A limitation of utilizing an application in lieu of a uniquely designed survey is the constraint of using questions written by a third party to approximate the research questions sought in a large sample size study. The archived answers given by more than 82,900 applicants in the dataset were used as proxies for the answers that might have been given if as a researcher I had surveyed this same group personally and written the survey instrument myself.

**Missing answers, sensitive questions, and falsified answers.** Another limitation of the dataset are two questions where applicants routinely left questions blank or answered that they had no knowledge. Of the above cited universal application questions, the ones with missing or unusable data points were parental educational attainment level, applicant educational intent, and gender. Although only 68 applicants did not answer the gender question in the final sample, hundreds self-selected not to answer the parental educational attainment level and the educational intent questions. Many reasons applicants may have had reservations about offering those answers include embarrassment, a lack of knowledge about parent educational histories, being not decided

on an academic program or degree, and a feeling that as adult learners, the educational level of parents was not applicable to them.

The data limitation of missing or unknown answers is coupled with the likelihood that some answers given were deliberately false. The applicants are required to answer select questions that must be answered for application to any MnSCU college or the application is rejected. MnSCU requires sensitive questions regarding residency, alien or asylee status, veteran, visas, and alias or maiden names. Although typical and routine to administrative employees in the registrar office, these may be troubling for applicants with citizenship in flux, unstable home life circumstances, or previous family situations that included foster care, marriage and divorce. A subset of applicants likely deliberately falsified some of the required universal application answers and self-selected to leave others blank for self-preservation or privacy purposes.

The limitation of the dataset that looms the largest is the ambiguity of answers given to the highest parental education level question. This question forces applicants to elect an educational level out of five levels or answer that they do not know for two parents or guardians. In the study, parental educational attainment was a proxy for homophily or family influence on the applicants' educational decisions. For internationally educated parents and guardians, these five American educational levels may not match educational systems in birth countries. Applicants who lived in nontraditional households had to select two out of 12 possible answers to this question on the universal application. These and other issues of choosing an educational level for parents or guardians may have led to the high count of missing and unknown answers to the parental educational level question. In the original raw dataset, this question was left blank 14,359 times and answered unknown 1,324 times.



### **Application iterations & dissimilarity of required questions 2003-2013.**

A definitive limitation of the dataset was a small addition to the questions in 2003 that changed all the years of MnSCU universal applications that followed. Although the study was originally conceived to be longitudinal, testing the strength of the relationship between the same variables during three academic cohorts of 2003, 2008, and 2013 this was quickly determined to be unfeasible. In 2003, the universal application was altered by MnSCU enrollment staff to include educational intent of the applicant. Before that academic year, potential students were only asked about program of instruction and college of choice. Since 2003 was the first year this change was added to the application, and it was not stipulated as a required answer, the total count of responses to the educational intent question was exceedingly low in that year. The marginal number of data points made a yearly comparison of similar applicant cohorts impossible. By the academic cohort of 2008, the total number of answers to the universal application question about educational intent had increased, but not sufficiently to do longitudinal comparison year-to-year with 2013. The only academic year of the original dataset with a statistically significant group of total applicants to total answers to the questions was 2013 and hence the dataset limitations induced the decision to narrow the study from longitudinal during 3 academic years to 1 academic year.

### **Parental educational attainment & applicant educational aspirations.**

Another important data limitation was the use of five ordinal levels for both the parental educational level and the applicant educational level. Although the question about parental education level gives applicants five levels to choose for two parents and or guardians, the levels of education are already obtained. The five educational levels are

readily differentiated by the applicant and are previously attained credentials known to most applicants.

In contrast, the five levels of applicant educational intent was likely aspirational. That educational level is an applicant goal that has not been obtained for most potential MnSCU enrollees. Although the parental educational attainment levels could easily be made into a collapsed ordinal variable benchmarked as highest level attained, the applicant educational intent is the opposite. The educational intent of the applicant can be multiple intents, such as earn a certificate and earning an associate degree. Consequently, the collapsed variable was benchmarked at the lowest educational level intended for projected enrollment in MnSCU. In the application process, no certainty exists that the applicants will become enrollees, or complete the coursework, certificate programs, or degrees they listed in the universal application for an intended MnSCU college. With a consistent 30% rate of new students requiring remedial academics across MnSCU, a possibility of applicants overestimating educational levels attained could not be ignored. As such, the conservative approach to this data limitation was to default to the lowest level of educational intent applicants provided for this question.

### **Unknown Data Analyst and Human Error**

A final limitation of the dataset obtained from MnSCU was the filtering by staff, which was beyond the influence or control of the researcher. The dataset was not assembled by the researcher. The transposing of universal application answers from a database query into a spreadsheet from source programs was an opaque and proprietary process conducted at MnSCU System Office. As the principle researcher, I was not granted direct access to the database where the raw data points on 82,900 applications reside, but instead was given an Microsoft Excel data file. This data file was exported

from a state agency database by an analyst at the MnSCU System Office under the director of institutional research. The source datasets were conveyed to the director of institutional research, then were filtered and queried by an unknown employee of MnSCU of unknown credentials. From time of request to delivery of database query was a 5-month span, whereby I did not guide the database filters or design the query that produced the final dataset. Hence, the potential for transposition errors and altered applicant information unknown to the MnSCU analyst or the researcher exist that could not be vetted, screened, or verified.

### **Population and Sample**

The study was designed to use population data from MnSCU applicants in academic cohort years to determine if factors of homophily are related to educational decisions of CTE bound students. As a unique study, research of the population was selected instead of sampling. Upon receipt of the raw dataset of  $N = 82,907$  encompassing all applicants in 2003, 2008, and 2013, it was quickly determined that two of those academic cohorts did not have sufficient data points to proceed. Neither academic year 2003 nor 2008 provided a numerically sufficient quantity of answers for the parental educational attainment level question to conduct the desired longitudinal analysis for the research phase of the study and were removed from the study.

### **Data Integrity Checks**

After narrowing the study to only the raw dataset from 2013,  $N = 28,599$ , data integrity checks began in earnest to remove vulnerable populations and applicants not pursuing CTE at MnSCU. The study is focused solely on postsecondary level education at MnSCU. To ensure minors were not included in the study, all Post-Secondary Education Option (PSEO) applicants were removed during the initial data integrity

checks. The first filter of PSEO decremented the dataset marginally because of the overwhelming educational intent of PSEO to attain baccalaureate degrees at one of the seven state universities not included in the study.

The next integrity check was to remove those applicants who did not fit the definition of CTE bound programs of instruction or schools. All the applicants listed an intended MnSCU college or university on the universal application. It was apparent how to dissect those applicants bound for institutions seeking 4-year or graduate degrees from the CTE applicants, by removing all that listed: Bemidji State, Metropolitan State, Minnesota State Mankato, Minnesota State Moorhead, Southwest Minnesota State, St. Cloud State, or Winona State. The MnSCU CTE colleges that remained in the study were 10 Metropolitan community and technical colleges and 20 outstate or rural community and technical colleges. Of note, although there are 31 community and technical colleges in the MnSCU system at the time of the study, 30 distinct colleges were analyzed in the statistical analysis (see lists in appendices). This discrepancy was because of the co-location of two colleges on a single campus, using a single physical address that made discerning the dependent variable of proximity in miles impossible between the two college venues.

Because the focus of the study was CTE applicants solely seeking baccalaureate or higher degrees, all applicants who singularly marked the education intent of “earn bachelor’s degree” on the universal application were also removed. The 2013 applicant population of CTE was then culled to remove those seeking the Associate of Fine Arts (AFA) degree. By MnSCU definition, the AFA is not considered a CTE track program among the 2-year degree program offerings; hence, this subset was also filtered out of the 2013 raw dataset.

The final data integrity checks were set to filter out applicants with sensitive personal and family circumstances who were neither residents of Minnesota nor completely free to give candid application responses. Although I requested these factors to be prescreened out of the raw dataset, upon data filtering I discovered that refugees, asylees, temporary protected status applicants and nonresident aliens were mistakenly included in the  $N = 82,907$ . To ensure all vulnerable populations were removed, beyond the PSEO minors, refugees, asylees, and temporary protected status applicants were culled from the dataset. Because of stipulations of the 2013 Dream Act, nonresident aliens are granted in-state tuition at MnSCU colleges and were retained in the study. Although included with reservation, the small subset of 144 nonresident aliens across the original three academic cohort years amount to less than one-tenth of the total applicants.

### **Demographic Data Screening and Fidelity Checks**

In the screening of data for home of record, MnSCU college, diversity, and gender, all applicants in the 2013 cohort offered answers to these questions. The MnSCU system is both state and federally funded, which creates the stipulation that all applicants must answer demographic questions on an application. This stipulation for the universal applications created the conditions, whereby the study benefitted from 100% of applicants having answers for these four data points. Although 68 of the 2013 applicants listed unknown for gender, none of the applicants left the gender question blank. These high levels of response rates were catalysts for successful and significant analysis later in the research phase of the study. The final 2013 cohort of MnSCU CTE applicants for the study was set at  $N = 28,520$  (see Table 1).

## **Coding and Transforming of Variables**

**Parental educational attainment levels.** The next phases after data integrity checks of the 2013 population were coding and transforming culled data into study variables. First among these coding steps was addressing the raw data for parental educational attainment level and transposing it into coded ordinal variable for statistical analysis. The hypothesis of the study is determining whether homophily influences educational decisions. To do comparisons of parental educational level to applicant educational level required coding to make two ordinal variables with similar “distance” between the five types of educational credentials. For the parents and guardians, these levels lowest to highest were no high school diploma, high school diploma, some college, 2-year college degree, and bachelor’s degree or higher. To accommodate for missing and “I don’t know” answers, additional dummy codes were added. Parental educational levels were coded 2, 3, 4, 5, 6, while missing answers were coded 0 and “I don’t know” were coded as 1. To reduce the ambiguity of two potential parental educational attainment levels because of up to two parents or guardians, the levels were collapsed into a single highest parental educational attainment level.

**Calculating distance from home of record to college of choice.** A second iteration of coding began by addressing the distance of the applicant from home of record to MnSCU college. The raw data for this variable was exported as 28,520 zip codes for home addresses. To proceed from raw data of zip codes and named colleges to a calculated distance required several additional coding steps. The state of Minnesota alone has 1,054 zip codes to sift through and a small group of outstate applicant zip codes as well. The 30 distinct MnSCU college physical addresses were identified for every applicant, converted first to zip codes and then to latitude and longitude. Zip codes for

applicant home of record were also converted to zip codes and then latitude and longitude. A transposed data point was created, distance in miles from home of record to MnSCU college. This created a continuous and scalar variable for every applicant to utilize in correlation analysis in the research phase. An important discovery of the coding phase was the exceedingly high number of applicants who live in close proximity to the intended MnSCU college. Considering no dormitories exist on campus for this population, applicants who lived in the same zip code were assigned a minimum .5 mile or 5 miles of distance from home of record to school to ensure no distances calculated would be 0 miles.

**Categorization of metropolitan or rural.** Knowing that the outstate applicants would inherently be a longer distance from their intended MnSCU college; another dichotomous data point was created to categorize applicants as outstate or metropolitan. Outstate applicants were coded as 0 and metropolitan applicants were coded as 1. To ensure the disparity in distance travelled outstate compared to metro from home to college, I accounted for outstate applicants in the same zip code by assigning 5 miles of distance as a minimum, whereas metro applicants in the same zip code were coded .5 mile. These two distances were chosen after analyzing the state demographer open source documentation on the size and density of the 87 counties of Minnesota. After reviewing demographer office information regarding the counties in which they reside, the final coding of .5 mile in metropolitan zip codes and 5 miles in higher Minnesota zip codes was finalized and added to the proximity variable (<http://mn.gov/admin/demography/map-viz-gallery/viz-co-pop-estimates.jsp>).

**Applicant educational intent levels.** The next variable among the 2013 source dataset to be addressed was the applicant educational intentions. Much like the parental

educational attainment levels, the applicants self-selected among five levels of educational credentials: complete courses, earn occupational certificate/diploma, earn associate degree, complete courses and transfer, and earn an associate degree and transfer. To account for missing answers, a dummy code of 9 was assigned to blanks. Coding for levels of applicant educational attainment were lowest to highest 1, 2, 3, 4, 5, and 9. Subsequently, I collapsed the five levels of educational intents into a single educational intent for every applicant. This created a second ordinal variable for analysis similar in levels and distance between levels to the parental educational attainment.

**Demographic categorical and dummy coding.** In addressing the nominal categorical data, dummy codes were also assigned to all data points for applicant demographic application answers. The gender categorical data were male, female or unknown. Dummy codes assigned were 1 for male, 0 for female, and 9 for missing. Categorical data for diversity were first collapsed then coded. All applicants had assigned racial and ethnic groups in the raw dataset. The six choices for electing a racial or ethnic background were not germane to the study in isolation, but were important to consider as a larger subset of diverse versus nondiverse applicants. Hence, the six elections were filtered with dummy codes into two categorical groups, nondiverse coded as 1, and diverse coded as 0. The collapsing of the diversity data points into two categories allowed for concise analysis similar to other dichotomous categorical variables for gender and outstate or metro.

### **Specification of Variables**

With the completion of the coding for the raw dataset for 2013, the final variables were built and ready for statistical analysis. The scalar variable is proximity home of record to college, the first ordinal variable is highest parental educational attainment, the



second ordinal variable is applicant educational intent, and there are three nominal, categorical, and dichotomous variables of gender, metro or outstate, and diversity. Table 1 presents the variables.

Table 1

*Frequencies and Percentages for Nominal and Ordinal Variables*

Variable	<i>n</i>	%
Applicant Educational Intent		
EARN AA AAS AS	5665	20
Earn Certificate	12036	43
Associate Degree Then Transfer	86	0
Courses Only	9034	32
Courses Then Transfer	1236	4
Gender		
Male	15214	53
Female	13238	47
Institution Metro OR Outstate		
Outstate	11764	41
Metro	16756	59
Parental Educational Attainment Level		
No High School	1566	6
High School Diploma	5486	20
Some College	5528	20
2-Year Degree	6321	23
Baccalaureate	8152	30
Diversity		
Nondiverse	20010	70
Diverse	8510	30

*Note.* Variables, Total Numerical Counts, and Percentage of Total  $N = 28,520$ .

**Dependent variable.** The dependent variable in this study was proximity for the applicant home of record to intended MnSCU college. This calculated variable was measured in miles from the zip code of the home of record to the zip code of the college selected on the universal application. It is a scalar variable with positive numerical values that run in a continuous manner from .5 miles to 372 miles for every applicant in the population of  $N = 28,520$ . I tested this variable statistically as a proxy for assessing the strength of the relationship between the applicants' educational decisions and their

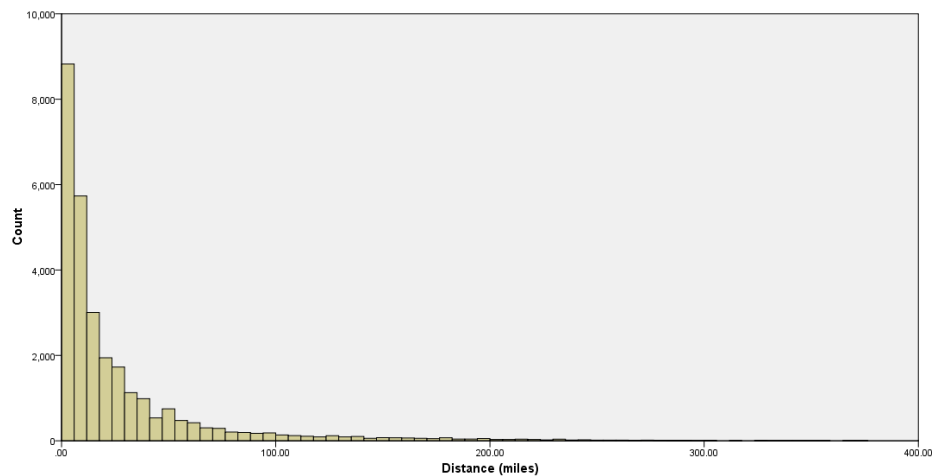
homophily of family and friends who influence them. This variable had a response rate of 100% for the 2013 population of MnSCU CTE applicants.

**Independent variables.** The five independent variables began with parental educational attainment level. This ordinal variable had five levels of finite answers collapsed from applicant responses on the universal application for MnSCU. The parental educational attainment level variable also had two dummy coded levels within it to account for  $n = 1,467$  missing and “I don’t know” applicant answers for a total of  $n = 27,053$  responses or 96.5% response rate. Second, among the independent variables was the applicant educational intent. This ordinal variable had five levels of finite answers derived from applicant answers to the universal application for MnSCU. The applicant educational intent level variable also had one dummy coded level within it to account for  $n = 463$  missing answers for a total of  $n = 28,057$  responses, with a response rate of 98%.

Among the three categorical variables, the most influential dichotomous nominal variable was the metropolitan or outstate college variable. This nominal calculated variable had two coded options based on the zip code of the elected MnSCU college of choice. The response rate for metro or outstate college was 100%. Second of the categorical variables was gender. Gender was a demographic, dichotomous nominal variable with two finite and one dummy coded election on the universal application. The applicants could select to identify as male, female, or unknown. To account for the unknown subset of  $n = 68$ , a third dummy code was built into the nominal data points for gender. The response rate to the gender variable was also 100%. Diversity is the final demographic, categorical nominal variable in the study. This collapsed variable grouped applicants into dichotomous groups based on self-identifying as either majority or a minority racial or ethnic heritage on the MnSCU universal application.

## Correlation Models and Hypotheses

The hypothesis of the study was determining whether homophily influences educational decisions. I conducted the logical testing on the strength of the relationship between variables. Correlations and other nonparametric tests were chosen as the best fit for the study. Considering the study variables were not true values with a constant variance and were highly unlikely to have a linear relationship, the assumptions for using Pearson correlations for statistical testing were not met. With a lone scalar variable and all other variables being either ordinal or nominal, the non-normalized data points were best suited for nonparametric testing. To compound the decision to utilize Spearman's Rho correlation were the outputs of calculating the proximity variable, which was highly skewed and positively skewed to the right (see Figure 3).



*Figure 3.* Proximity of the total count of applicants and miles to college, dependent variable.

I conducted Model 1 Spearman's Rho to analyze proximity and metropolitan or outstate college.

**H<sub>1</sub>.** Applicant decisions on MnSCU colleges are related to the proximity to homophily.

**Null<sub>1</sub>.** There is no significant relationship between proximity to family for applicants.

I conducted Model 2 Spearman's Rho to analyze proximity and diversity.

**H<sub>2</sub>.** Applicant decisions on proximity to homophily are related to diversity.

**Null<sub>2</sub>.** There is no significant relationship between proximity to homophily and diversity.

I conducted Model 3 Spearman's Rho to analyze proximity and gender.

**H<sub>3</sub>.** Applicant decisions on proximity to homophily are related to gender.

**Null<sub>3</sub>.** There is no significant relationship between proximity to homophily and gender.

### **Other Nonparametric Tests: Kruskal Wallis**

I conducted three Kruskal-Wallis rank sum tests to assess if significant differences existed in proximity of home to college between the categories of institution metropolitan or outstate, diversity, and gender. This test was utilized as a secondary statistical test to ensure quality control in the study.

### **Ethical Considerations**

As an educational researcher, it is my utmost desire to accurately portray the population of 2013 applicants holistically as a cohort and still staying true to the answers given by individuals on the MnSCU universal application. To that end, I struggled with decisions on the removal of any applicant from the raw dataset, but ultimately felt compelled to do so to preserve data integrity instead of a desire for absolute inclusion. An example of this research strife manifested with errant applicant answers in the home of record question. Discarding the 39 applicants who put in zip codes that did not match any city in the U.S. Postal Service zip code finder and discarding the eight applicants

seeking solely to pursue AFA degrees was troubling. Although the AFA does not meet the definition of a CTE degree program it was still a labored decision to simply remove any applicant from the study.

More disconcerting was the decision to include or exclude the 595 applicants from the original raw dataset self-identified as vulnerable adult populations. To silence an already marginalized group of potential MnSCU enrollees was unnerving, but including groups that may already suffer retribution personally or professionally because of refugee, asylee, or protected status seemed prudent. These vulnerable subsets were also a small group numerically, but were concentrated in the metropolitan colleges. To leave a vulnerable group in the study geographically aligned with a select number of metro colleges felt pejorative; therefore, the entire vulnerable group was removed.

An important area for me to maintain confidentiality with regard to applicant data is the other raw information included in the original dataset that went far beyond the parameters of the study. Although not germane to the study, several data points obtained in the database query could have been misused or interpreted for targeting subgroups with less than honorable results. All six categories of racial and ethnic heritage were included for all applicants. Although such information would be germane to a study on cultural influencers, it was not pertinent to a study of homophily and educational intentions. I collated those thousands of data points on race and ethnicity with data on other sensitive applicant social and demographic background to include service in the armed forces, citizenship, residency, visa applications, Perkins eligibility, program preferences, and several others not germane to the study. I ensured these thousands of raw data points were protected and will remain protected.

## Chapter 4: Quantitative Research Results

### Introduction of Research Questions

I conducted this study to test if a relationship existed between applicant contextual factors and their college of choice. I aimed to determine whether applicants chose postsecondary MnSCU colleges close to home, close to people they identified with, close to their homophily. I also aimed to determine how strongly correlated were their college choices to their sociodemographic circle of friends and family.

**RQ1.** Did MnSCU applicants tend to select colleges closer to their homophily?

H<sub>01</sub>. Applicant decisions on MnSCU colleges are related to the proximity to homophily.

Null<sub>01</sub>. There is no significant relationship between proximity to family for applicants.

**RQ2.** Was applicant racial or ethnic heritage linked to decisions on how close to home applicants elected potential colleges?

H<sub>02</sub>. Applicant decisions on proximity to homophily are related to diversity.

Null<sub>02</sub>. There is no significant relationship between proximity to homophily and diversity.

**RQ3.** Were applicant decisions on college preference related to the distance from their homophily and differentiated by gender?

H<sub>03</sub>. Applicant decisions on proximity to homophily are related to gender.

Null<sub>03</sub>. There is no significant relationship between proximity to homophily and gender.

## Results of Descriptive Statistical Analysis

Analysis was conducted on the  $N = 28,520$  applicant cohorts from the following colleges with the average distance home of record to college of choice (see Table 2). The 30 listed MnSCU colleges with unique zip codes are in descending order from largest applicant pool for Academic Year 2013 to smallest applicant pool. Also listed is the average distance in miles for the applicant cohorts for each of the 30 unique campuses listed. Of the 30 colleges in the study, 10 were metropolitan and 20 were outstate. Figure 5 is a graphical representation of every college with the size of the sphere portraying the magnitude of the respective applicant pools with the comparative average distance each colleges applicant cohort selected.

Table 2

*MnSCU CTE Colleges Total Applicants & Average Proximity Home of Record to College*

College	Applicants	Average Miles
Metro Technical College	2783	16.37
Metro College	2312	8.28
Metro Community and Technical College	2245	8.85
Metro College	1977	11.90
Metro Community College	1507	9.87
Outstate Technical and Community College	1315	25.78
Outstate Community and Technical College	1306	24.35
Metro Technical College	1214	14.52
Metro Community College	1208	12.37
Metro Community College	1105	15.42
Outstate College	1100	47.72
Outstate Technical & Community College	1010	66.06
Metro Technical College	980	12.87
Outstate Technical and Community College	954	66.16
Outstate College	909	43.18
Metro Community College	881	11.38
Outstate College	698	30.17
Outstate College	661	42.60

College	Applicants	Average Miles
Outstate College - Technical	544	45.17
Outstate Community and Technical College	538	71.05
Outstate Community College	498	31.91
Outstate - Technical & Community College	472	65.96
Outstate Technical College	437	43.10
Outstate Community College	424	64.55
Outstate Technical and Community College	341	31.04
Outstate Tribal and Community College	301	19.93
Outstate Community College	296	44.81
Outstate College	278	33.45
Outstate Community College	201	188.21*
Outstate Community College	25**	101.65

Note. \* Vermillion Community College applicants are outliers compared to other colleges with a skewed proximity average. VCC average distance is 8 times the average applicant's distance from HoR to college of choice 23 miles. \*\* Rainy River Community College had so few applicants that it is not statistically sufficient to study as an individual college n=25 from the comprehensive dataset of N=28,520 applicants.

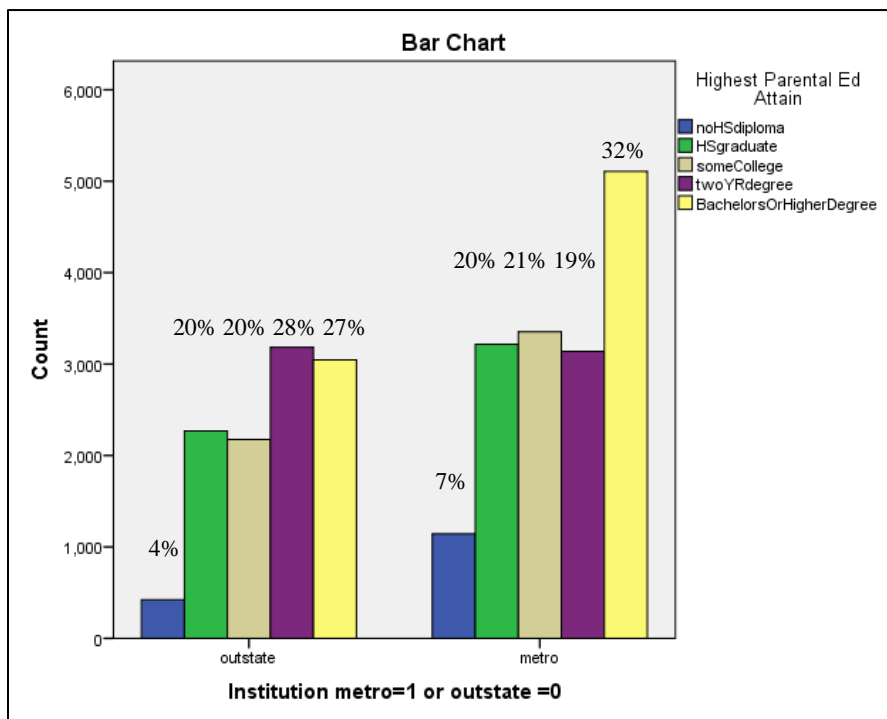


Figure 4. Parental educational attainment.



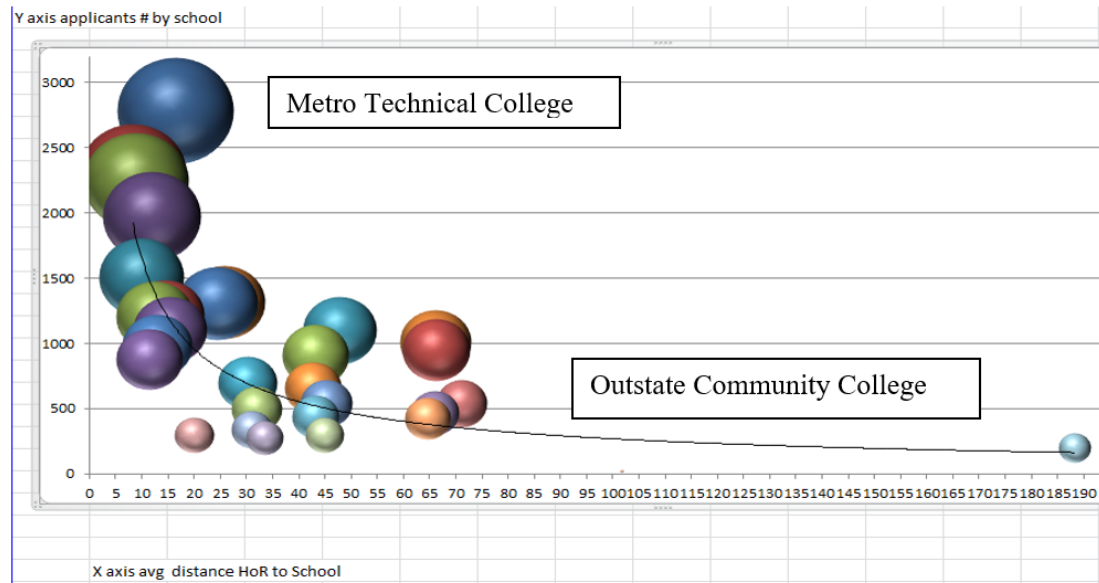


Figure 5. Magnitude graph of applicant pool size compared to average distance in miles to college.

### Frequencies and Percentages

The most frequently observed category of Applicant Educational Intent was earn certificate ( $n = 12036$ , 43%). The most frequently observed category of Gender was male ( $n = 15214$ , 53%). The most frequently observed category of Institution was metro ( $n = 16756$ , 59%). The most frequently observed category of Parental Educational Attainment Level was baccalaureate ( $n = 8152$ , 30%). The most frequently observed category of Diversity was nondiverse ( $n = 20010$ , 70%).

### Means and Standard Deviations

The observations for proximity home of record to college ranged from 0.01 to 372.18 miles, with an average of 23.02 miles ( $SD = 36.91$ ; see Table 3).

Table 3

*Means and Standard Deviations for Continuous Proximity Variable*

<i>Variable</i>	<i>n</i>	<i>min</i>	<i>max</i>	<i>M</i>	<i>SD</i>
Proximity home to college	28,520	0.01	372.18	23.02	36.91

## **Summary of Descriptive Statistics of MnSCU 2013 Applicants**

Applicants in the MnSCU 2013 academic year were predominantly nondiverse males with parents who have some college or a degree bound for metropolitan colleges to obtain a credential or certification. Applicant aggregate average distance from home of record to college of choice was 23.02 miles. Applicants who chose outstate colleges had an average distance from home to college of 46.54 miles  $N = 11,764$ , whereas applicants who selected metropolitan colleges had an overall average distance from home to college of 13.12 miles  $N = 16,756$ . As seen in Figures 1 and 4, applicants selecting large metropolitan institutions predominately were within 5 miles or less from home. The histogram of metropolitan college applicants depicts an extreme right skewness in Figure 2. The histogram of outstate college applicants also depicts a right skewness in Figures 1 and 3, but far less skew of distances than outstate bound college applicants factored into the decision to attend colleges farther or nearer to home.

## **Descriptive Statistics of Educational Attainment of Parents: Metro and Outstate**

Parental and guardian educational attainment levels were similar across the outstate and metropolitan college bound applicants (see Table 1). The descriptive statistics conducted on this variable benefited from highly reliable data because of the high response rate of 94.9% for a total of  $N = 27,053$  applicants offering at least one or multiple parents or guardians highest educational level attained. Of that total, nearly all outstate applicants responded  $N = 11,096$  and the missing responses  $n = 1,467$  resided predominately among metropolitan applicants. The percentage of parental educational attainment of the first four categories of no high school diploma, high school graduate, some college, and two 2-degree were similar outstate compared to metro applicants. The two categories that were dissimilar were the percentage of applicants bound for metro

colleges of choice who identified parents with educational levels of a bachelors or higher degree and the percentage of outstate applicants with parents who held two year degrees. The metro applicants were 5% higher in the reported level of educational attainment of parents with a baccalaureate or higher degree. The outstate applicants were 9% higher in the reported level of parents who had obtained two year degrees (see Figure 4).

### **Summary of Descriptive Statistics: Applicant Educational Aspirations**

Applicant educational intent garnered a 98.3% response rate, similar to the other ordinal variables in the quantitative research; still, this was an exceedingly high rate for reliable and valid analysis. Among the applicants who answered the parental educational attainment question and the educational intent question of the MnSCU Universal Application,  $N = 26,649$  or 93.4% answered both, creating a strong data starting point for comparing these variables. The most prevalent applicants had parents with a bachelor's or higher degree and their educational aspiration was to obtain an associate degree. The most prevalent applicant response encompassed 12% of respondents to both educational attainment questions. The least common combination of parental educational attainment and applicant educational intent was the applicants seeking only to take courses then transfer and who identified parents with no high school diploma. This was true for both outstate and metro applicants of Academic Year 2013.

A category of educational intent that was differentiated by applicants selecting outstate or metro community or technical colleges was the level of degree or credential sought. The most frequent educational level sought was an associate degree for both metro and outstate, but for outstate applicants, the second most prevalent choice was obtaining an occupational certificate at 32.7%, followed by a distant third intention of obtaining a 2-year degree and transferring at 13.4%. Whereas metro applicants second

and third educational intentions were quite similar between applicants who sought an occupational certificate at 30.6%, those who intended to pursue a 2-year degree and transfer was at 25.6%.

### Results of Inferential Statistical Analysis

**Spearman Rho Correlation H<sub>01</sub>.** I conducted a Spearman correlation analysis for institution metro or outstate and proximity home to college. A significant negative correlation existed between institution metro or outstate and proximity home to college,  $r = -0.44$ ,  $p < .001$ , indicating a modest relationship existed between institution metro or outstate and proximity home to college. Tables 4–6 present the results of the correlation.

Table 4

#### *Spearman's Rho Correlation Proximity to Metro or Outstate MnSCU College*

Variable	Correlation with Institution metro or outstate	<i>p</i>
Distance (Miles)	-.44	< .001

*Note.* \*\*Correlation is significant at the 0.01 level (2-tailed).

**Spearman Rho Correlation H<sub>02</sub>.** A Spearman correlation analysis was conducted for diversity and proximity home to college. A significant positive correlation existed between diversity and proximity home to college,  $r = 0.29$ ,  $p < .001$ , indicating a slight relationship existed between diversity and proximity home to college. Table 5 presents the results of the correlation.

Table 5

#### *Spearman's Rho Correlation of Proximity to Applicant Diversity*

Variable	Correlation with Diversity	<i>p</i>
Distance (Miles)	.29	< .001

*Note.* \*\*Correlation is significant at the 0.001 level (2-tailed).

**Spearman Rho Correlation H03.** A Spearman correlation analysis was conducted for gender and proximity home to college. No significant correlation existed between gender and proximity home to college,  $r = .01$ ,  $p < .064$ , indicating no significant relationship existed between gender and proximity home to college. Table 6 presents the results of the correlation.

Table 6

*Sprearman's Rho Correlation of Proximity to Gender*

Variable	Correlation with Diversity	<i>p</i>
Distance (Miles)	.01	.064

Ultimately, two of the three research questions on applicant choice of college were correlated to applicant proximity to their homophily. Both variables for diversity and institution location outstate or metro were found statistically significant by testing with correlation. Strongest of the correlated variables was the relationship between applicants selecting metro or outstate colleges and their proximity to home. Correlations conducted on these two variables benefited from highly valid and reliable data because of the exceptional response rates of 100%. This was partly because of the MnSCU rejection criteria, whereby every submitted MnSCU Universal Application is required to have a home of record address and an intended college. The strongest relationship among those two variables was the negative correlation of the 2013 academic year MnSCU applicants selecting colleges close to home in the metro.

The second correlation of diversity and proximity to homophily yielded a modest relationship between the tested variables. Diverse applicants were the more likely group to select colleges closest to home. This subset of 2013 applicants equated to 30% of applicants, compared to the 20,010 nondiverse applicants for racial or heritage

demographic categories. The dispersion of diverse applicants was centered in the metro with 79.6% or 6,777 of the diverse applicants selecting metro MnSCU schools.

Correlations run on these two variables benefited from highly valid and reliable data because of the exceptional response rates of 100%. This result occurred because of the MnSCU rejection criteria, whereby every submitted MnSCU Universal Application is required to have an identified racial or ethnic heritage as well as an intended college

The third research question regarding the relationship of gender to college choice was not correlated. Correlations run on these two variables also benefited from highly valid and reliable data because of the exceptional response rates of 99%, only 68 responses out of 28,520 were missing. This result was because of the MnSCU rejection criteria, whereby every submitted MnSCU Universal Application is required to have gender identity and an intended college. Male and female applicants were nearly equally represented among the population of  $N = 28,520$  with 53% male and 47% female. However, no appreciable relationship existed between gender and how close to friends and family applicants selected colleges from the institutions across MnSCU.

## **Chapter 5: Interpretation, Conclusions, Significance of Research**

### **Interpretation of Results**

Two of three research questions tested were significant regarding the influence of contextual factors of homophily on the college preferences of applicants. The strength of the correlation coefficient may have been moderate, but the reliability of the instrument was strong and the validity of the responses to instrument questions were ideal because of the same instrument being used for all MnSCU applicants for more than 18 consecutive years. The significance of the relationship between college choices that are close to home cannot be overstated. Most applicants across all 30 MnSCU CTE community college and technical institutions selected campuses as close to home as were geographically available.

The vast majorities of applicants to metropolitan colleges were within the same zip code and most were less than 10 miles away from their college of choice. The college with the lowest average distance from home of record to college was in Saint Paul with an average distance across all 2013 applicants of 8.28 miles. Even intended students bound for colleges in rural Minnesota were highly likely to select a college close to family. In addition, among the outstate schools, those with tribal affiliations had some of the lowest outstate average distances from home of record to college. In particular, an outstate Tribal Community College applicant pool averaged 19.93 miles from home to college of choice. This rural college was one of several distinct examples of the strong inferential relationship between applicants' college choices and the influence of their homophily.

An unpredicted but recurring influencer resides in the influence of demographic dispersion of colleges and programs at select colleges statewide. Although 60% of the

Minnesota population resides in the metro, one-third of the MnSCU colleges are located in the seven country metropolitan area. The 10 metropolitan MnSCU career and technical colleges were nearly identical in proportion as state demography, or 59% of the total applicant population. The 20 outstate MnSCU community and technical colleges accounted for 41% of the total applicant population. A compounding influencer that was unaccounted for in the contextual analysis of homophilic influences was the intended credential or degree program sought, compared to the location or locations where it is offered.

Although an applicant may desire to stay close to home for college, that may not be possible in the MnSCU system depending on the intended program. For this study, I posited that without a variable to gauge desired program, the results underestimated the actual contextual influencer of applicants to pursue academic programs of their choice at colleges of their choice. This programmatic mitigating factor may have significantly influenced the correlation and artificially suppressed the measured relationship of the proximity in all three correlational analyses. The Spearman correlation coefficient of -.438 was likely heavily decremented by the inability of the proxy variables to assess the applicants' desired college in conjunction with their preferred program for postsecondary coursework. The statistical analysis would have benefited from a variable to test a three-way relationship between college of choice, program of choice availability across MnSCU, and proximity to applicant home of record.

A discerning assessment of the boxplot (see Appendix D) provides insights into the groups that selected colleges close to home and those that did not. At the base of the boxplot are the thousands of applicants who selected colleges within a few miles of the home of record, graphically portraying the central tendency of the 2013 applicant pool of



MnSCU. The outliers are located along the vertical plot line to the maximum distance that outstate and metro applicants chose colleges. I posited that these outlier applicants selected colleges more than 100 miles from home in the outstate group and more than 35 miles from home in the metro applicant pool, not because of a lack of influence by their respective homophily, but because of a lack of availability of their program of choice. The central tendency group could be construed as having the convenience of a college and a program of their choice near their homophily. The outliers in the extremes of the boxplots represent the applicants who likely chose a desired academic program over all other factors in the decision-making process.

An ideal way to illuminate the disparity is to analyze a program offered at almost every college compared to a program only offered at a single college. The business administration and management program is offered in all six geographic MnSCU regions and at all but two colleges statewide. Hence, an applicant could live nearly anywhere in Minnesota and be within 40 miles of their 2-year degree program of choice at the nearest college to home (see Figure 6).



Figure 6. MnSCU colleges geographically arrayed across Minnesota. Retrieved from: <https://www.minnstate.edu/colleges/campuses.html>

Dissimilarly, the applicant who sought to pursue a program in taxidermy could only pursue this program at Vermillion Community College in Ely, Minnesota. Hence, the hyper skewed average distance for applicants to this college is almost certainly not linked to desire to attend college close to one's homophily, but instead is predicated on the constraint of a single geographic location to obtain the academic coursework of choice at Vermillion Community College. The propensity for the applicants to select a niche program instead of the desire to pursue college close to home was not factored into the variables in the inferential tests, but arose in the data filtering that enabled the

descriptive statistical analysis. Other niche programs that have only a single academic campus available for program seekers includes Geospatial Intelligence and Imagery Analysis, Engineering Technology, Wood Sciences, Parks and Recreation, Musical Instrument Repair, Nondestructive Testing, Air Traffic Controlling and Dispatching, and Gunsmithing.

Another descriptive factor driven by Minnesota demographic dispersion is the likelihood of an applicant's home of record being proximate to one or several nearby MnSCU colleges. The highest density of population per square mile by county in Minnesota was Hennepin County, according to the 2014 census data of the state demographer office ([www.mn.demogov](http://www.mn.demogov)). In contrast to the overwhelming density of citizens in the seven county metro, the topographical area that the metropolitan counties encompass is only 3.5% of the entire square miles of the 87 counties of the state. Outstate Minnesota accounts for the other 96.5%, but applicants from the more rural portions of outstate typically live many miles further from a MnSCU college than a metro resident of Minnesota.

Although this distance disparity was addressed in the calculated proximity value by assigning applicants who lived within the same zip code of a metro college .5 miles of distance to campus, the outstate applicants were assigned 5 miles of distance to campus if they resided in the zip code of the college of choice. What was not accounted for empirically was the proximity of home of record to a single MnSCU college or several MnSCU technical and community colleges. An anecdotal means of highlighting this disparity of access is to compare a diverse male applicant who resides in zip code 55076 versus the same applicant who lives in zip code 55720. The first applicant resides in Inver Grove Heights and is within 20 miles of every MnSCU college of the 10 metro

based community and technical college locations. The second applicant lives in Cloquet and has one college within a 20-mile radius of home. At the 10 metro based colleges, the applicant from Inver Grove can choose from nearly all general or niche programs to pursue academic desires close to home. The applicant from Cloquet has a limited slate of programs to choose from at a single school close to home. Even if the two applicants were both male members of one of Minnesota's 11 federally recognized tribes, of similar sociodemographic background, and intending to pursue similar programs, they would have incongruent access to MnSCU colleges because of geographic dispersion of colleges in outstate compared to metropolitan areas of Minnesota.

The descriptive statistics of the parental educational levels compared to the educational intentions were similar and unremarkable for the three most sought after applicant educational intentions. The influence of homophily on college choices arose again in the geographic areas applicants hailed from. Much like the differentiated groups found in the boxplot of the proximity to homophily marked by distinct central tendency and outliers differentiated between outstate and metro college bound applicants, differentiation also existed among educational levels. Outstate applicants were far more likely to pursue an associate degree or an occupational certificate rather than other academic aspirations. Of respondents for outstate colleges, 79% chose those two educational credentials. Metro applicants were most inclined to obtain an associate degree followed by second and third choices at nearly the same rate of selection for certificates as pursuing a 2-year degree to then transfer. Together, the metro applicants' second and third choices of earning an occupational certificate and obtaining a 2-year degree to transfer comprised 56.3% of metro respondents. The outstate applicants tended to select 2-year degrees or certificates with less tendency to transfer than metro

applicants. The relationship between applicant educational aspirations and the influence of homophily may surface in rural families, influencing applicants to pursue occupational certificates and associate degrees as terminal degrees. Metro applicants seem to be influenced by their friends and family to pursue associate degrees as a bridging strategy to obtain additional postsecondary education opportunities.

### **Study Conclusions Compared to Other MnSCU Studies**

Conducting macro-level research at the state educational system level can be unique and challenging. A distinct benefit of such a large population for an empirical study is the perspective of having comprehensive data for all CTE colleges in a system at one's disposal for analysis. MnSCU educates and trains more than 400,000 students per year and among that student population, the vast majorities were CTE program bound applicants. Although limited in number, other researchers have focused on the CTE branch of Minnesota higher education.

An unintended consequence of conducting unique research at the MnSCU system level is having no relevant, recent, or similar studies for establishing benchmarks for comparison. None of my four mentors at MnSCU had conducted system level research. Each mentor conducted studies in the late 1990s on a sample of the student population or the MnSCU faculty. Other dissertations referenced beyond my MnSCU faculty mentors tended to be samples from single MnSCU institutions focusing on either currently enrolled students, current faculty or MnSCU graduates. The dissertation by Dr. Michael Roberts (2008), *School to Career Transitions: Career Awareness and CTE Students*, focused on tech-prep high school students at Anoka Technical College. Although a quantitative study, Roberts focused on regression analysis of less than 200 secondary students in one postsecondary educational venue. The closest research study design to

my own is that of the current Director of Institutional Research at MnSCU. In Schoenecker's 2006 dissertation, *Economic Returns to Graduates of a State System of Colleges and Universities*, the researcher focused on the regression analysis of returns on educational degrees obtained at all 31 technical and community colleges plus the seven state universities. In this longitudinal study of  $N = 42,326$  MnSCU graduates, the researcher was mostly intent on finding the employment and economic returns of MnSCU education from certificate seekers through graduate degrees. Neither of these two recent quantitative studies on MnSCU was based on applicants for CTE postsecondary level of education.

Most research specifically on MnSCU are qualitative studies both by my MnSCU mentors and doctoral peers. The dissertation by Dr. Jessica Stumpf, *Meeting the Needs: Does Technical College Education Meet the Needs of Employers* (2007), pertained to linking the graduates of MnSCU with AAS degrees with employer needs of select AAS degree holders at Hennepin Tech. Stumpf focused this qualitative study on select graduate outcomes based on 30 interviews centered on one MnSCU institution. Dr. Jane Birkholz's (2002) dissertation, *An Examination of Employment Status and Career Intent of Baccalaureate Degreed Reverse Transfer Graduates in Two-Year College Environments* (2002), is a survey-based mixed methods study of 80 degree holders who returned to MnSCU colleges. Birkholz used chi square tests to assess the influence of employment status on decisions to return to college.

The limited relevant MnSCU research with which to make comparisons to other MnSCU research was challenging. Looking beyond the state to a national research comparison netted 25 results in the comprehensive digital dissertation search through ProQuest. Of the 25 results in the queried dissertations that included the theoretical

premise of homophily and college in the abstract, none were studies of the state system level of CTE. Of that same group, no dissertations pertained to applicants, whereas most focused on faculty, first-year college student behaviors or educational outcomes.

### **Study Conclusions Compared to Other Studies of Homophily and Education**

No other researchers specifically analyzed the influence of homophily and applicant decisions regarding CTE colleges in Minnesota or nationally. However, a few studies exist on collegiate choice and homophily. Of note, among similar scholarly work in the area of homophily and specifically educational homophily is McPherson et al. (1987, 2001). These authors are from the sociology research realm and tend to also conduct studies at the macro or system level. Multiple studies authored by these authors and others, such as Brashears, Thomas, and Reagans, have used archived General Social Survey 1985 or 2004 as reference datasets for studying trends of educational homophily (Brashears, 2012; Kossinets & Watts, 2009; Marsden, 1987; Reagans, 1999; Thomas, 2009). Still other educational researchers have utilized social distance or social habitus as the theoretical premise in studying college choice and college choice influencers (Acker-Ball, 2007; Graff, 2011, Stevens et al, 2008).

Sociological researchers Lazarfeld and Merton (1954) originally termed homophily and initially suggested it to have two types: status homophily or value homophily. Educational homophily is strongly affiliated with the parental educational attainment linked to status homophily, and family and friends conveying the value of higher education to applicants. The educational and sociological researchers in the 21st century utilize this sociologic theoretical premise to increasingly describe decision making models in the educational, personal, and professional spheres of research subjects. Lazarfeld and Merton also posited homophily had two inherent causes:

structural and cognitive. Cognitive homophily is sociologically linked to who people freely chose to interact with and who are similar, and structural homophily is the homophily that is tacit in (a) where people are from geographically, (b) familial, and (c) communities of interactions that people are born into or come from.

### **Significance of Study**

Independent studies of the MnSCU system are both prescient and needed in an era of constrained higher education budgets paired with increasing demand. Of the two branches of postsecondary research, at research universities, hundreds and thousands of studies on 4-year liberal arts higher education can be easily referenced and cited from academic search engines. At the UMN, the totals of studies and dissertations in the CTE area have declined markedly in the last 20 years. This trend is an inverse and disproportionate trend compared to the rapid rise of MnSCU CTE degree and credential seekers during the last two decades. In the MnSCU system, the student enrollments from 1990 to 2010 increased tenfold (MnSCU, 2010). In the same era that the demand on the MnSCU system leadership and department of institutional research has the most requirements for accountability and proof of academic effect on the Minnesota workforce, few outside research articles and dissertations exist to cite and lean on. Beyond this current dissertation, the most recent before it that studied MnSCU at the UMN is from 2009.

The significance of this study is found both in the ways and the means. First, it is a unique study, not attempted before studying the MnSCU system level. This study is designed around archived data to quantitatively analyze the strength of the relationship between influencers of friends and family on applicant college choices. As a macro level study of  $N = 28,520$ , the concerns encountered with inadequate sample size, lack of



diversity, lack of dispersion both geographically and across variables of parental educational attainment, and educational intent are avoided. This study benefits from a substantial population size, nearly equal in representation of gender, outstate and metropolitan selected colleges, and majority as well as diversity categorical delineations.

Novel research offers new insights into the oldest and largest institutions. MnSCU has been in existence in various forms for more than 70 years. In 1945, the legislature passed the Area Vocational-Technical School Enabling law to formally establish and fund vocational education in the state. The area vocational technical institutes started with a single school in Mankato in 1947 (MnSCU, 1995). The MnSCU system is now a mature educational system with a bevy of unmet demands from employers and students alike.

### **Limitations**

Archived data, although highly comprehensive over time, is prone to transposition error and longitudinal discrepancies. The change of a few words or the addition of a single question to a survey instrument changes the raw data points assembled and results that can be garnered from that dataset. The same care cannot be taken with each data cell entry to datafiles with thousands of individuals' information contrary to the small sample set of a researcher conducting small sample direct observations. No means exist to verify with unnamed applicants that their write-in answers to crucial questions, such as home address, educational intent, box checks, or parental educational levels, are correct. With the archived dataset, I trusted the database analyst with transposing every cell of each column of all applicants' information with accuracy.

Even the Director of Institutional Research had no direct interaction with the original instrument as it changed from 2003 to 2008, until its present form in 2013 and

beyond. Considering the universal application has been in use for 18 years at MnSCU, few of the system level registrar or institutional research analysts remain from its implementation date. When the question on parental educational level was altered to become more inclusive of guardians or when the asylee and resident alien status questions were inserted, no one can speak to exact dates of changes. These seemingly small changes evince themselves in problematic ways with regard to conducting longitudinal research across academic years. A lack of this information creates dissimilarities in the responses and response rate to select universal application questions, which in turn increases the errors made when attempting to design a study utilizing longitudinal correlations.

Although the intent of the preliminary study was the analysis of academic cohorts of applicants correlated during 5-year increments, this was not feasible. The incrementally altered nature of the universal application precluded this study aspiration. Changes during the life of the instrument to such key questions as residency status, inclusion of Dream Act applicants, and parental educational attainment altered to include variations, such as guardians, made the survey instruments dissimilar in the select questions year to year. Some questions between 2003, 2008, and 2013 datasets were changed to include a *do not want to answer* or *unknown* option. This was highly problematic in attempting to compare applicant cohorts in academic years where some questions regarding gender, race, and parental educational attainment were mandated or optional across three distinct academic years of applicant data.

This study of archived data did not benefit from the pre- and posttest experiment design, or in-person interviews. CTE applicant data was not given with the accompanying enrollee or graduate data for the same MnSCU student identification

numbers. I did not have the means to assess the subset of applicants who became enrollees or the means to confirm how strong the educational intentions of applicants were to the smaller subset of the 2013 cohort that progressed from applicant, to enrollee, to graduate. Without either a follow-up survey that links applicant data to graduate data, or graduate surveys or follow-up interviews, it is not possible to speculate on the 2013 academic cohort that entered the 30 community and technical colleges. To more fully understand the influence of homophily at a more significant level of decision making than application form submission will require further study with a pre- and post-enrollment study design.

With an original dataset including 82,907 applicants' data during three distinct academic years, the allure to do several possible statistical tests was tempting but unobtainable. I decided to stick narrowly to what was approved in the oral defense prior to candidacy. With copious amounts of scalar, ordinal, and nominal data, I was tempted to run a variety of nonparametric tests or even make the leap to other inferential statistics with regression analysis and modelling projections. But despite all the empirical possibilities, the approved research for the study was on the influence of contextual factors of homophily on applicant intentions for CTE education. Therefore, the narrow focus and prudent research study approach was to stay on course with correlations and a single approach to relational nonparametric testing.

An area of the study where I dedicated a significant deal of analysis in the descriptive statistics, but nearly none in the inferential statistics, was the analysis of parental educational attainment in relation with applicant educational aspirations. This was not because of researcher neglect but rather a lack of well-suited analytical tests to obtain correlational analysis of paired non-normalized ordinal variables with nominal

coded variables. Correlational analysis is a test that works best with scalar continuous variables, can work well with finite interval ordinal variables, and applies somewhat with semi-structured interval variables derived from free-form answers to a questionnaire style application. The error prone responses to educational intent, parental academic attainment, and select sociodemographic information do not align with the stringent goodness of fit tests for running rigorous statistical tests that are predominately parametric. This leaves a social science researcher searching for a nonparametric methodology when one does not have a random or normalized sample but instead has a non-normalized, archived population.

The MnSCU Universal Applications submitted by applicants to community and technical colleges for 2013 all were the exact same application, but the answers given to questions of educational levels were not bounded by evenly spaced intervals. The distance between educational intents was five nominal categories with two categories that were repetitive for associate degrees and one that focused on the technical college educational goal of an occupational certificate. Responses given by applicants were also their estimation of parental or guardian educational attainment, which are prone to error and exaggeration. Moreover, responses given by applicants to questions of educational intent are aspirational. Although a sizeable margin of error was expected in applicant responses on parental educational attainment, which is an estimation of past education that was completed by parents and or guardians. The educational intent is completely aspirational; the applicant may never set foot in a MnSCU college or obtain a credential or degree from the listed college on the application form. To avoid the risk of running errant statistical tests that were a poor fit as the ordinal interval variables for a

correlational statistical analysis, descriptive statistics was the conservative but logical option.

A staunch decision point in moving forward with the MnSCU dataset included a limitation that impacted statistical tests of all study variables; it was the selection of the researcher to not normalize the dependent variable. The proximity variable is a calculated distance in miles for 100% of the 2013 applicants. For outstate applicants and metro applicants alike, the applicants overwhelmingly selected colleges within mere miles of home (see Appendix D, figures 1 and 2). The most prevalent proximity for metro applicants was one half to a mile from home to college of choice which represented 60% of the metro subset. The most prevalent proximity for outstate applicants was one half to five miles from college to home which represented 25% of the outstate subset of applicants. Although the histograms readily showed extreme right skewness and some researchers may have elected to use natural  $\log_{10}$  to normalize the dataset of  $N=28,520$ , I did not choose to normalize the 2013 cohort. Instead, the decision was made to favor numerical counts in the descriptive and inferential statistical results, whereby every applicant equated to a 1.0 or counted as a whole person in lieu of the more conventional approach of converting numerical counts to percentages or transposing to a normal curve and standard deviations.

## **Chapter 6: Implications and Future Research**

### **Implications For Theory Development**

I sought to answer how this study complemented or expanded other existing theories with homophily and specifically the connection to homophily and education studied by McPherson et al. (1987, 2001). First, it takes the level of the research from the national level, with the utilization of national level social science surveys, down to the macro level with a single state in the span of the study. McPherson et al. utilized a national level census style survey of lifestyle behaviors to perform correlation studies regarding Americans' proclivities to make choices based on their homophily. I further focused on the state college system level, pertaining to a single year of applications, in a single system of community and technical colleges. Through this study, I also pursued the relationship between homophily of outstate or more rural applicants and compared that group to metro based applicants. Traditions, customs, and cultures of rural families' influence on applicants appears to be differentiated from metro families' influence on MnSCU applicants and their decisions for college of choice system-wide.

Focusing on the educational intentions of applicants instead of the exit survey data of graduates changes the perspective of educational research often based on data assembled post hoc instead of a priori. Classroom observations, pre- and post-testing of experiment subjects, and surveying graduates are perennial methods for assembling educational research datasets. So much of quantitative educational research is aligned with post hoc methods. I examined the opposite of outcomes, because through this study, I projected what shapes applicant decisions prior to ever enrolling in an educational program. I examined intentions of potential adult learners attempting to gauge educational aspirations in conjunction with homophily influences. This pre-educational

landscape leans toward the decision-making influencers within the social sphere of applicants

### **Implications For Research**

Although much educational research tends to reside at the micro or nano levels, there is more to learn at the macro level beyond the single college or single classroom. At the MnSCU system level, the institutional research could be linked to this study to shift from an archived and rearview mirror view to trendlines, done with applicant projections that lead to modelling of incoming MnSCU CTE cohorts. Educational researchers in the CTE strata have argued for sizeable studies focused in the quantitative paradigm (Gemici & Rojewski, 2007; Gordon, McClain, Kim, & Maldonado, 2010; Grubb, 2001). Rojewski referenced the 2002 Education Sciences Reform Act and the verbiage on scientifically-based research standards, as well as the specified definition for scientific research adopted in the 2006 Perkins CTE Improvement Act. Furthermore, he warned of the harm that could be done to the CTE field if researchers did not elect more rigorous research standards in light of increasing criteria-based measures for obtaining federal funding. Moreover, Gordon et al. (2010) cautioned CTE researchers as a collective group should not only increase the scope of quantitative research studies in CTE, but collate studies into a meta-analysis.

This study is a unique correlation study of a single academic year of applicants from a state's postsecondary education system, but analyzed in conjunction with other studies, this study could become part of a potential meta-analysis. As Gordon et al. (2010) envisioned, studies with similar variables common to a multitude of educational research works, such as sociodemographic data, could be aggregated into much larger analyses, creating immense sample sizes and compounding effects (Gordon et al., 2010).

## **Implications for Practice**

The Vice Provosts of academic affairs as well as the program design teams of the MnSCU community and technical colleges can gain significant information from this study regarding the tendencies of incoming academic cohorts, instead of merely being a sieve, whereby enrollees show up on the first day and get sorted into campuses and programs. Academic affairs leaders and program designers could better place the academic programs geographically based on known trends for program demand and based on both geographic and demographic longitudinal trends. In addition, after reviewing the results of this study, the Chancellor of MnSCU could attend the next subcommittee hearing for the Senate or House Education Committee with more information regarding how much funding is needed in the next biennium. This information and subsequent funding will do more than merely keep the doors open on 54 campuses, but instead this information will help determine the projected demand of the educational system for Minnesotans to obtain education for work from outstate colleges, metro colleges, metro programs, and outstate programs. Redundancies in the metro programs within a 20-mile radius could be addressed by increased access to in-demand programs expanded for outstate.

## **Implication for Public Policy**

What if the committee on education were not dominated by UMN grads, but instead evenly distributed with MnSCU grads and degree holders from other institutions. Would better policy and funding decisions result each biennium? Would the UMN and MnSCU continue to get funding at near parity if the education committee members knew where that state funding from taxes was spent compared to the funding from benefactors? Although the ROI at MnSCU seems low, these metrics may be skewed, considering the



mission of MnSCU is not to produce degreed graduates, but to produce the educated workforce of the state. Therefore, if only a fraction of MnSCU applicants are bound for colleges to obtain 4-year degrees, I am interested to determine why money is sent to academic institutions that produce degrees instead of toward the predominate amount of Minnesotans obtaining education for employment.

With the current research, I found that an overwhelmingly majority of applicants were bound for occupational credentialing programs. Therefore, I feel that MnSCU is being measured by external policy makers with the wrong measuring tactics. One of the most heavily weighted measures of effectiveness for the UMN system of five campuses is the percent of degree attainment within 6 years of enrollment. That measure of effectiveness does not adequately measure what MnSCU produces for Minnesotans, the Minnesotan economy, or the employers of MnSCU graduates statewide. Bragg highlighted this disparity of benchmarking community and technical colleges more than 15 years ago:

Community colleges, whose open access mission is deeply embedded in their past and equally important to their future, require new thinking about student outcomes. To continue to be measured by the same yardstick as elitist institutions relegates them to a subordinate position, always struggling to demonstrate that their students are successful . . . To explicitly communicate their position provides the opportunity to uncover the tensions and reveal the contradictions that exist in the American higher education system. A richer and more appropriate set of outcomes could be found that appropriately reflect the comprehensive mission of the institutions and the students they attempt to serve. (Bragg, 2001)

Currently, MnSCU uses a strategic accountability dashboard that assesses system level effectiveness in five main areas: Financial Index, enrollment, Facilities Condition Index, Licensure Exam pass rates, and student persistence and completion (<https://www.mnscu.edu/board/accountability/index.html>). The UMN Strategic Vision published in October 2014 lists four priority areas as university system goals: build exceptional research and curriculum, support excellence and reject complacency, recruit and retain field-shaping researchers/teachers, and establish a culture of reciprocal engagement (University of Minnesota, Office of Academic Affairs and Provost, 2014). These are measured in two scorecards embedded within the annual university report a gold with 10 measures and maroon scorecard with 11 measures of accountability.

Another researcher who broached the topic of CTE system level research and suggested policy reform was Harmening (2013). Harmening analyzed six state systems and found that systems varied widely regarding the types of institutions available statewide and the influence that state system level offices had on educational venues. Within a state system, distinctions exist between the variety of institutions, including community college and career and technical colleges, which differ within states and within systems. Minnesota's state system structure, funding model, bylaws, academic curriculum, and administration may not be a match to any other state in the 57 states and U.S. territories. However, MnSCU as a system may be highly similar to applicant sociodemographic factors, educational intent, and metropolitan versus rural dispersion as other state college systems. This similarity to other state systems may enable select findings from this study to be used in comparative analysis and potentially become generalizable if the same variables are studied in adjacent systems.

## **Recommendations for Additional Research**

Although the correlation of gender and proximity of home of record to college was not statistically significant, future researchers may find the interaction of gender and other variables statistically significant in further study. During the data integrity checks and initial descriptive statistical analysis, some trends with regard to nominal and ordinal variables became apparent. The percentage of applicants who were both Minnesota residents and intended to attend colleges within 10 miles of their homes was high. Although not conducted during this study, testing variability that includes within group analysis of diverse males or diverse female applicants may provide further insights. In the data culling and data integrity checks, the split between degree or credentials sought were highly dissimilar for metro versus outstate and gender. A cursory review of frequency analysis showed the degrees sought by rural applicants fell distinctly into groups differentiated by gender. I did not focus analysis on CTE degree program applicants intended to pursue analyzed by demographics, but further research into this area of MnSCU bound enrollees is warranted. Another area of future focus is that significant disparities exist between the programs sought by select racial and gender subsets of applicants. The sociodemographic effect may be found to be more pronounced in outstate versus metro colleges of choice.

Future researchers may garner insights from a college-by-college variation analysis. Researchers could determine if within group variances exist between sociodemographic factors differentiated at each of the 30 distinct MnSCU community and technical colleges. Future researchers should also consider exploring between group variances apparent across different MnSCU colleges. Another area of study to consider could be to determine if institutions are programmatic outliers similar to Vermillion

Community College, predicated on the uniqueness of niche programs that are a draw for all applicant subsets. A yearly longitudinal study of the same variables may also show subtle or profound changes during the span of 5 years or show shifts in the college preferences across 10-year increments. By expanding the research to be more encompassing with the inclusion of the 2003 and 2008 data into a longitudinal study, other analytical methodologies become available.

Future researchers should expand on researching comparisons across all 3 academic years and the seven state colleges removed in the current study could be reintroduced and used as a comparative tool with CTE bound applicants. Comparison of the 30 MnSCU community and technical college applicants to the seven state university bound cohort may provide further results across the three academic years of archived data available. With an archived population of more than 80,000 applicants nearly evenly spread across the 3 academic years of archived data, the within group and between group analysis of variance is an additional avenue for further study.

Future researchers could also extend the current research by altering the means of coding and filtering select variables. Changing the applicant educational intent from a collapsed variable that is set to the highest educational intent would drastically change the output of the same variables tested. Changing the collapsed variable for parental educational attainment from highest among the parents or guardians to lowest could also have a significant effect on the correlations on these variables. This analysis would involve a relational analysis of the most aspirational applicant educational intentions with the least of the parental educational attainment. The inference is that the parents or guardians with the least amount of education might be the most influential on select sociodemographic subsets of the applicant population.

A relationship may be found in the link to homophily and future study of the effect of the Minnesota economy on applicant choices pre- and post-recession. The original dataset included the academic years 2003, 2008, and 2013; these years were purposefully chosen to align with the pre-recession, recession, and post-recession economic turns in the state during that decade. Future researchers could explore (a) if applicants in 2003 potentially selected colleges that were farther from home because of additional family influence or support compared to the recession year of 2008; (b) if socioeconomic status of family influencers had measurable effects on applicant decisions for postsecondary CTE in the pre and post-recession academic years; and (c) if applicants chose programs further from home or possibly chose to pursue higher levels of credentials or degrees in the academic years before and after the recession, but elected less or more postsecondary schooling in 2008?

A sizeable area of suggested further research with a new research survey instrument is the postgraduate or exit survey. Instead of the focus of the exit survey aligning strictly with postsecondary education at MnSCU leading to employment in the field of study, researchers could use the exit survey to ascertain both praxis and concurrently project intent. An exit survey at the graduation, 1-year, and 5-year mark could help assess both the utility of program in obtaining relevant employment but also the propensity for furtherance of academic pursuits. Future researchers could determine if the graduates of the Graphic Design and Illustration program go on to work in that field and return for additional coursework at the next academic level. Obtaining knowledge regarding the link between applicant educational intentions and graduate intentions to return for additional postsecondary education could create a parallel set of projections of applicant and graduate intentions for continued higher education.

With the addition of quantitative longitudinal exit survey data, insights could be garnered into the content and contextual influences that make CTE students stay until coursework and credential completion. A comparison of CTE matriculation and exit survey trends during a multi-year period might answer research questions regarding whether learners' decisions about CTE are stable over time or possibly stable generationally in the state of Minnesota. Comparative data longitudinal in nature also will enable future research of comparable or similar state CTE systems to be conducted.

### **Summary**

In this study of the Minnesota State Colleges and University system applicants from 2013, I set out to determine if a relationship existed between applicant choices and the influence of friends and family. Homophily is pervasive in the influence it exerts on peoples' choices of who to identify with, what groups to join, what religions to follow, and what educational choices to pursue. I found that MnSCU applicants overwhelmingly choose community and technical colleges within a few miles of home. A strong link exists between applicant educational choices and proximity to their home of record. Through this novel research, I found most metro applicants selected educational campuses less than 5 miles from home and family. Although the many applicants from the cohort of 2013 had parents or guardians with a degree, the majority of the applicants were pursuing a certificate or credential in a technical program.

If future researchers link applicant responses to exit surveys in a longitudinal study, a compelling long-term perspective of the Minnesotan adult learner may emerge. The results of this study enable policy makers to understand postsecondary enrollee intentions to make changes regarding education and work, and dismiss long-standing suppositions regarding the two branches of higher education in the state. What may form

is the true profile of postsecondary learners, proving that the Minnesota student body, body politic, and workforce need highly educated, more than ever.

## Expanded Lists

### List 1: ALL MnSCU Technical & Community Colleges

\*from largest to smallest applicant subset

Hennepin Technical College	Metro
Saint Paul College	Metro
Minneapolis Community and Technical College	Metro
Century College	Metro
North Hennepin Community College	Metro
St. Cloud Technical and Community College	Outstate
Rochester Community and Technical College	Outstate
Dakota County Technical College	Metro
Normandale Community College	Metro
Anoka-Ramsey Community College	Metro
Ridgewater College	Outstate
Minnesota State Technical & CC Fergus Falls	Outstate
Anoka Technical College	Metro
Alexandria Technical and Community College	Outstate
Lake Superior College	Outstate
Inver Hills Community College	Metro
South Central College	Outstate
Central Lakes College	Outstate
Minnesota State College - Southeast Technical	Outstate
Northland Community and Technical College	Outstate
Riverland Community College	Outstate



Minnesota West - Technical & CC	Outstate
Northwest Technical College – Bemidji	Outstate
Hibbing Community College	Outstate
Pine Technical and Community College	Outstate
Fond du Lac Tribal and Community College	Outstate
Itasca Community College	Outstate
Mesabi Range College	Outstate
Vermilion Community College	Outstate
Rainy River Community College	Outstate

List 2: All MnSCU CTE Colleges Total Applicants & Average Proximity Home of

Record to College

College	Applicants	Average Miles
Hennepin Technical College	2783	16.37
Saint Paul College	2312	8.28
Minneapolis Community and Technical College	2245	8.85
Century College	1977	11.90
North Hennepin Community College	1507	9.87
St. Cloud Technical and Community College	1315	25.78
Rochester Community and Technical College	1306	24.35
Dakota County Technical College	1214	14.52
Normandale Community College	1208	12.37
Anoka-Ramsey Community College	1105	15.42
Ridgewater College	1100	47.72
Minnesota State Technical & CC Fergus Falls	1010	66.06
Anoka Technical College	980	12.87
Alexandria Technical and Community College	954	66.16
Lake Superior College	909	43.18
Inver Hills Community College	881	11.38
South Central College	698	30.17
Central Lakes College	661	42.60
Minnesota State College - Southeast Technical	544	45.17
Northland Community and Technical College	538	71.05
Riverland Community College	498	31.91

Minnesota West - Technical & CC	472	65.96
Northwest Technical College - Bemidji	437	43.10
Hibbing Community College	424	64.55
Pine Technical and Community College	341	31.04
Fond du Lac Tribal and Community College	301	19.93
Itasca Community College	296	44.81
Mesabi Range College	278	33.45
Vermilion Community College	201	188.21*
Rainy River Community College	25**	101.65

\* Vermillion Community College applicants are outliers compared to other colleges with a skewed proximity average. VCC average distance is 8 times the average applicant's distance from HoR to college of choice 23 miles.

\*\* Rainy River Community College had so few applicants that it is not statistically sufficient to study as an individual college  $n = 25$  from the comprehensive dataset of  $N = 28,520$  applicants.

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## Appendix A: Data Use Agreement

### DATA DISCLOSURE AND USE AGREEMENT

#### BETWEEN

#### MINNESOTA STATE COLLEGES AND UNIVERSITIES AND PATRICIA G. BAKER

This Data Disclosure and Use Agreement is dated this 24<sup>th</sup> day of July, 2015 by and between the Patricia G. Baker, an individual, with an address at 2000 70th Street West, Inver Grove Heights, MN 55077, (“Baker” or “Receiving Party”) and the State of Minnesota, by the Board of Trustees of the Minnesota State Colleges and Universities, (“State” or “MnSCU” or “Disclosing Party”) at St. Paul, Minnesota, 55101.

#### RECITALS

**WHEREAS**, the Receiving Party has requested, records for Minnesota resident students enrolled at the State’s colleges for the purpose of conducting research for a doctoral dissertation; and

**WHEREAS**, the parties wish to establish terms and conditions applicable to Receiving Party’s data request for student records;

**NOW THEREFORE**, in consideration of the mutual covenants contained herein and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

- A. **DISCLOSURE.** The State shall prepare and provide the requested de-identified student records. Appendix A contains a list of the requested data elements to be provided.
- B. **COSTS.** Receiving Party agrees to pay the costs of preparing the student records. State shall provide a written invoice of such costs and Receiving Party shall pay in full before obtaining the requested records. Payment shall be made by check to: “Minnesota State Colleges and Universities” and delivered to the State’s authorized representative.
- C. **USE.** The Receiving Party will be the only individual to access the data and will limit use of the student records provided by the State to the conduct of doctoral dissertation research on the topic of career and technical education student matriculation choices.
- D. **DATA PRIVACY.** The Receiving Party must comply with the Minnesota Government Data Practices Act, Minnesota Statutes Chapter 13, as it applies to all data provided by the State in accordance with this AGREEMENT, and as it applies to all data, collected, received, stored, used, maintained, or disseminated by the Receiving Party in accordance with this AGREEMENT. The civil

remedies of Minnesota Statutes Section 13.08, apply to the release of the data referred to in this Article by either the Receiving Party or the State. The Receiving Party may not disclose the student data to any person or entity other than the State unless otherwise required or authorized by law. The Receiving Party additionally must destroy the data and any other individual data about the State's students that are created for the study by June 30, 2016 or 100 days after completion of the doctoral dissertation, whichever occurs first; and the Receiving Party must notify the State that it has destroyed the data.

- E. **DATA SECURITY.** The Receiving Party shall transfer the student data from the State on a secure USB drive; and shall only store the data in an encrypted file on the Receiving Party's personal computer; and shall only conduct the research with software on that computer.
- F. **PUBLICITY.** Any publicity given to the program, publications, or services provided resulting from this contract, including, but not limited to, notices, informational pamphlets, press releases, research, reports, signs, and similar public notices prepared by or for the Receiving Party or its employees individually or jointly with others, or any subcontractors shall identify the State as the sponsoring agency and shall not be released prior to receiving the approval of the State's authorized representative.
- G. **AUTHORIZED REPRESENTATIVES.**  
**State's Authorized Representative:** Minnesota State Colleges and Universities' Authorized Representative for the administration and supervision of this agreement is Craig Schoenecker.  
**Receiving Party's Authorized Representative:** Receiving Party's Authorized Representative for the administration of this agreement is Patricia Baker.
- H. **ASSIGNMENT.** The provisions in this Agreement shall inure to the benefit of the respective parties, their legal representatives, successors, and assigns.
- I. **APPLICABLE LAW.** The statements in this Agreement are contractual terms and not mere recitals. This Agreement shall be governed by and construed in accordance with the laws of the State of Minnesota.
- J. **LIABILITY.** Receiving Party agrees to indemnify, hold harmless and defend, with the approval of the Minnesota Attorney General's Office, the State against all liabilities, claims and causes of actions due to Receiving Party's unauthorized use or disclosure of the student records.
- K. **EFFECTIVE DATES.** This Agreement shall be effective from the date of the last signature by the parties, below, to June 30, 2016.

L. **SEVERABILITY.** If any provision of this Agreement is illegal or unenforceable, its invalidity shall not affect the other provisions of this Agreement that can be given effect without the invalid provision. If any provision of this Agreement does not comply with any law, ordinance or regulation, such provision to the extent possible shall be interpreted in such a manner to comply with such law, ordinance or regulation, or if such interpretation is not possible, it shall be deemed to satisfy the minimum requirements thereof.

**IN WITNESS WHEREOF,** the parties have executed this Agreement on the date first above written.

Patricia G. Baker

Patricia G. Baker  
Signature

Principal Investigator  
Title #1507E75941

24 JUL 2015  
Date

Minnesota State Colleges and Universities

Craig Schoenecker  
Signature

Senior System Director for Research  
Title

7/30/2015  
Date

## Attachment A: Data Elements

1. Student Sequential Identifier
2. Fiscal Year of Enrollment
3. State of Residence
4. Zip Code of Permanent Address
5. Residency Status
6. Citizenship
7. Parent One Education
8. Parent Two Education
9. Parent Three Education
10. Parent Four Education
11. Name of College
12. Major 1 CIP Code
13. Major 1 Description
14. Major 1 Award
15. Major 1 Perkins Eligible Flag (CTE)
16. Major 2 CIP Code
17. Major 2 Description
18. Major 2 Award
19. Major 2 Perkins Eligible Flag (CTE)
20. Major 3 CIP Code
21. Major 3 Description
22. Major 3 Award
23. Major 3 Perkins Eligible Flag (CTE)
24. Educational Intent: Earn occupational certificate/diploma
25. Educational Intent: Earn Associate Degree
26. Actual first semester of enrollment full-time/part-time
27. Gender
28. IPEDS Reported Race Ethnicity
29. Hispanic
30. American Indian or Alaska Native
31. Asian
32. Black or African American
33. Native Hawaiian or Other Pacific Islander
34. White
35. Non-Resident Alien
36. Unknown Race/Ethnicity



## Appendix B: Institutional Review Board Exempt Study Notification

### 1507E75941 - PI Baker - IRB - Exempt Study Notification

irb@umn.edu

8/5/1  
5

to me

TO : [parkx002@umn.edu](mailto:parkx002@umn.edu), [baker541@umn.edu](mailto:baker541@umn.edu),

The IRB: Human Subjects Committee determined that the referenced study is exempt from review under federal guidelines 45 CFR Part 46.101(b) category #4 EXISTING DATA; RECORDS REVIEW; PATHOLOGICAL SPECIMENS.

**Study Number:** 1507E75941

**Principal Investigator:** Patricia Baker

**Title(s):**

Minnesota Career & Technical Education: MnSCU Applicants and the Influence of Homophily

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This e-mail confirmation is your official University of Minnesota HRPP notification of exemption from full committee review. You will not receive a hard copy or letter. This secure electronic notification between password protected authentications has been deemed by the University of Minnesota to constitute a legal signature.

The study number above is assigned to your research. That number and the title of your study must be used in all communication with the IRB office.

If you requested a waiver of HIPAA Authorization and received this e-mail, the waiver was granted. Please note that under a waiver of the HIPAA Authorization, the HIPAA regulation [164.528] states that the subject has the right to request and receive an accounting of Disclosures of PHI made by the covered entity in the six years prior to the date on which the accounting is requested.

If you are accessing a limited Data Set and received this email, receipt of the Data Use Agreement is acknowledged.

This exemption is valid for five years from the date of this correspondence and will be

filed inactive at that time. You will receive a notification prior to inactivation. If this research will extend beyond five years, you must submit a new application to the IRB before the study's expiration date.

Upon receipt of this email, you may begin your research. If you have questions, please call the IRB office at [\(612\) 626-5654](tel:6126265654).

You may go to the View Completed section of eResearch Central at <http://eresearch.umn.edu/> to view further details on your study.

The IRB wishes you success with this research.

## Appendix C: MnSCY Universal Application

# Minnesota State Colleges & Universities Application for Admission

**Directions:** This application form may be used to apply to any of the 31 Minnesota State Colleges and Universities including state universities, community colleges, technical colleges, and comprehensive community and technical colleges. The system does not include the University of Minnesota.

**All applicants must sign the application form in the box provided on page 4.**

**The high school preparation standards section on page 4 should be filled out by state university applicants only.**

**Please print or type. Complete the form accurately. Misrepresentation of application information is sufficient grounds for canceling admission.**

**A one-time \$20 non-refundable application/records fee must be included with your application to EACH institution.** (Some institutions may waive this fee in cases of extreme financial need. Fee waiver may be granted for eligible service members or veterans. Contact the college's or university's Office of Admissions for more information about its policy.)

**Use a separate form to apply for graduate school or international admission at state universities.** Call the Office of Admissions where you wish to attend to request the required form.

**Submit this application to the college/university of your choice (see addresses on page 2).**

**Official high school and college transcripts must be submitted to the Office of Admissions of the college or university you wish to attend.**

**If you have not already done so, you should apply for financial aid as soon as possible.** Many students who qualify for aid do not apply and do not receive funds that may be available for them. Even if you do not qualify for grant aid, submitting a Free Application for Federal Student Aid (FAFSA) is required to be eligible for federally guaranteed loans. You may fill out a FAFSA online by going to [www.fafsa.ed.gov](http://www.fafsa.ed.gov).

**Visit [www.mnscu.edu](http://www.mnscu.edu) to search programs and explore colleges and universities, or call 1-888-667-2848 for more information.**

NOTE: We are asking you to provide information about yourself that is private under state and federal law. We are asking for this information in order to process your application.

You are not legally required to provide the information requested, however, we may not be able to effectively process your application if you do not provide sufficient information. With some exceptions, unless you consent to further release your private information, access to this information will be limited to system officials, who have legitimate educational interests in the information. Under certain circumstances, federal and state laws authorize release of private information without your consent:

- n to other schools in which you seek or intend to enroll, or are enrolled;
- n to federal, state or local authorities for purposes of education program compliance, audit or evaluation;
- n as appropriate in connection with your application for, or receipt of, financial aid;
- n to your parents, if your parents claim you as a dependent student for tax purposes;
- n if the information is sought with a subpoena, court order, or otherwise permitted by other state or federal law, and
- n to an organization engaged in educational research or an accrediting agency.

Minnesota State Colleges and Universities abide by the provisions of Title IX and other federal and state laws forbidding discrimination on the basis of sex, race, color, national origin or handicap and all other state and federal laws regarding equal opportunity. This document can be made available in alternate formats, such as large print or cassette tape, upon request by calling one of the numbers above.

If you have been arrested, charged or convicted of any criminal offense, you should investigate the impact that the arrest, charge or conviction may have on your chances of employment in the field you intend to study or on your chances to obtain federal, state, and other higher education financial aid.

The Minnesota State Colleges and Universities system is an equal opportunity employer and educator. This document is available in alternative formats to individuals with disabilities, consumers with hearing or speech disabilities may contact us via their preferred Telecommunications Relay Service.

# Minnesota State Colleges & Universities

<b>MINNESOTA STATE UNIVERSITIES</b>	<b>Anoka-Ramsey Community College**</b>	Brooklyn Park, MN 55445	<b>Minnesota West Community &amp; Technical College</b>	(218) 749-0313
<b>Bemidji State University*</b>	Two campus locations	Eden Prairie campus	Five campus locations	1-800-657-3860
1500 Birchmont Drive NE	(763) 433-1300	13100 College View Drive	www.mnwest.edu	www.mesabirange.edu
Bemidji, MN 56601	www.anokaramsey.edu	Eden Prairie, MN 55347	Canby campus	Eveleth campus
1-877-236-4354	Cambridge campus	<b>Inver Hills Community College</b>	1011 First St. W. Canby, MN	1100 Industrial Park Driv
www.bemidjistate.edu	300 Spirit Drive S.	2500 E. 80th St.	56220(507) 223-72521-800-	Eveleth, MN 55734
<b>Metropolitan State University</b>	Cambridge, MN 55008	Inver Grove Heights, MN	658-2535	Virginia campus
700 Seventh St. E.	Coon Rapids campus	55076	Granite Falls campus	1001 W. Chestnut St.
St. Paul, MN 55106-5000	11200 Mississippi Blvd. NW	(651) 450-3000	1593 11th Ave. Granite Falls,	Virginia, MN 55792
(651) 793-1302	Coon Rapids, MN 55433	www.inverhills.edu	MN 56241(320) 564-5000	<b>Rainy River Community College***</b>
www.metrostate.edu	<b>Anoka Technical College**</b>	<b>Lake Superior College</b>	Jackson campus	1501 Highway 71
<b>Minnesota State University, Mankato</b>	1355 W. Highway 10	2101 Trinity Road	401 West St. Jackson, MN	International Falls, MN
122 Taylor Center	Anoka, MN 55303	(717) 733-7601	56143(507) 847-7920	56649
Mankato, MN 56001	(763) 576-4850	1-800-432-2884	Pipestone campus	(218) 285-7722
(507) 389-1822	www.anokatech.edu	www.lsc.edu	1314 N. Hiawatha Ave.	1-800-456-3996
1-800-722-0544	<b>Central Lakes College</b>	<b>Minneapolis Community &amp; Technical College</b>	Pipestone, MN 56164	www.rainyriver.edu
www.mnsu.edu	Two campus locations	1501 Hennepin Ave.	(507) 825-6800	<b>Vermilion Community College***</b>
<b>Minnesota State University Moorhead</b>	www.clcmn.edu	Minneapolis, MN 55403	1-800-658-2330	1900 E. Camp St.
1104 Seventh Ave. S.	Brainerd campus	(612) 659-6200	Worthington campus	Ely, MN 55731
Moorhead, MN 56563	501 W. College Drive	1-800-247-0911	1450	(218) 235-2191
(218) 477-2161	Brainerd, MN 56401	www.minneapolis.edu	Collegeway Worthington, MN	1-800-657-3608
1-800-593-7246	(218) 855-8037	<b>Minnesota State College - Southeast Technical</b>	56187(507) 372-3400	www.vcc.edu
www.mnstate.edu	1-800-933-0346	Two campus locations	<b>Normandale Community College</b>	<b>Northland Community &amp; Technical College</b>
<b>St. Cloud State University</b>	Staples campus	1-877-853-8324	9700 France Ave. S.	Two campus locations
720 Fourth Ave. S.	1830 Airport Road	www.southeastmn.edu	Bloomington, MN 55431	www.northlandcollege.edu
St. Cloud, MN 56301-4498	Staples, MN 56479	Red Wing campus	(952) 358-8201	East Grand Forks campus
(320) 308-2244	(218) 894-5100	308 Pioneer Road Red Wing,	1-866-880-8740	2022 Central Ave. NE
1-877-654-7278	<b>Century College</b>	MN 55066	www.normandale.edu	East Grand Forks, MN
www.stcloudstate.edu	3300 Century Ave. N.	(651) 385-6300	<b>North Hennepin Community College</b>	56721
<b>Southwest Minnesota State University</b>	White Bear Lake, MN 55110	Winona campus	7411 85th Ave. N.	1-800-451-3441
1501 State St.	(651) 773-1700	1250 Homer Road	Brooklyn Park, MN 55445-	Thief River Falls campus
Marshall, MN 56258	1-800-228-1978	P.O. Box 409	2299	1101 Highway 1 E.
(507) 537-6286	www.century.edu	Winona, MN 55987	(763) 424-0702	Thief River Falls, MN 56701
1-800-642-0684	<b>Dakota County Technical College</b>	(507) 453-2700	1-800-818-0395	1-800-959-6282
www.smsu.edu	1300 145th St. E.	<b>Minnesota State Community &amp; Technical College</b>	www.nhcc.edu	<b>Northwest Technical College*</b>
<b>Winona State University</b>	Rosemount, MN 55068	Four campus locations	<b>Northeast Higher Education District</b>	905 Grant Ave. SE
P.O. Box 5838	(651) 423-8000	1-877-450-3322	<b>Hibbing Community College***</b>	Bemidji, MN 56601
Winona, MN 55987	1-877-937-3282	www.minnesota.edu	1515 E. 25th St.	(218) 333-6645
(507) 457-5100	www.dctc.edu	Detroit Lakes campus	Hibbing, MN 55746	1-800-942-8324
1-800-342-5978	<b>Fond du Lac Tribal &amp; Community College</b>	900 Highway 34 E.	(218) 262-7207	www.ntcmn.edu
www.winona.edu	2101 14th St.	Detroit Lakes, MN 56501	1-800-224-4422	<b>Pine Technical &amp; Community College</b>
<b>MINNESOTA STATE COMMUNITY &amp; TECHNICAL COLLEGES</b>	Cloquet, MN 55720	Fergus Falls campus	www.hibbing.edu	900 Fourth St. SE
<b>Alexandria Technical &amp; Community College</b>	(218) 879-0808	1414 College Way	<b>Itasca Community College***</b>	Pine City, MN 55063
1601 Jefferson St.	1-800-657-3712	Fergus Falls, MN 56537	1851 E. Highway 169	(320) 629-5100
Alexandria, MN 56308	www.fdlccc.edu	Moorhead campus	Grand Rapids, MN 55744-	1-800-521-7463
(320) 762-4520	<b>Hennepin Technical College</b>	1900 28th Ave. S.	3397	www.pinetech.edu
1-888-234-1222	Two campus locations	Moorhead, MN 56560	(218) 322-2340	<b>Ridgewater College</b>
www.alextech.edu	(952) 995-1300	Wadena campus	1-800-996-6422	Two campus locations
	1-800-345-4655	405 Colfax Ave. SW	www.itascacc.edu	1-800-722-1151
	www.hennepintech.edu	Wadena, MN 56482-1447	<b>Mesabi Range College***</b>	www.ridgewater.edu
	Brooklyn Park campus		Two campus locations	Hutchinson campus
	9000 Brooklyn Blvd.			

2 Century Ave. SE Hutchinson, MN 55350(320) 234-8500  
 Willmar campus  
 2101 15th Ave. NW  
 PO Box 1097Willmar, MN 56201(320) 222-5200  
**Riverland Community College**  
 Three campus locations  
 1-800-247-5039  
 www.riverland.edu  
 Albert Lea campus  
 2200 Riverland Drive  
 Albert Lea, MN 56007  
 (507) 379-3300

Austin campus  
 1900 Eighth Ave. NW  
 Austin, MN 55912  
 (507) 433-0600  
 Owatonna College & University  
 Center  
 965 Alexander Drive SW  
 Owatonna, MN 55060  
 (507) 455-5880  
**Rochester Community & Technical College**  
 851 30th Ave. SE  
 Rochester, MN 55904  
 (507) 285-7265

1-800-247-1296  
 www.rctc.edu  
**St. Cloud Technical & Community College**  
 1540 Northway Drive  
 St. Cloud, MN 56303  
 (320) 308-5089  
 1-800-222-1009  
 www.sctcc.edu  
**Saint Paul College**  
 235 Marshall Ave.  
 St. Paul, MN 55102  
 (651) 846-1600  
 1-800-227-6029

www.saintpaul.edu  
**South Central College**  
 Two campus locations  
 www.southcentral.edu  
 Faribault campus  
 1225 Third St. SW  
 Faribault, MN 55021  
 (507) 332-5800  
 1-800-422-0391  
 North Mankato campus  
 1920 Lee Blvd.  
 North Mankato, MN 56003  
 (507) 389-7200  
 1-800-722-9359

\* Bemidji State University and Northwest Technical College are aligned.  
 \*\* Anoka-Ramsey Community College and Anoka Technical College are aligned.  
 \*\*\* The Northeast Higher Education District is a consortium of five state colleges: Hibbing, Itasca, Mesabi Range, Rainy River and Vermilion.

OFFICE USE ONLY  
 DATE RECEIVED DATE ACCEPTED APPLICATION FEE PAID

**PERSONAL INFORMATION**

Name (Last, First, Middle) Date of Application

Name used in high school records or in other educational records and transcripts, if different from above (Optional) (Last, First, Middle)

Social Security number Providing your Social Security number is voluntary. If you do not provide this number, your application will still be processed. Many colleges/universities use Social Security numbers for student identification purposes on internal student records. The number may be used for purposes of administration, program evaluation, \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ consumer and alumni data, and also may be used to create summary information about system programs through data matches with other state agencies.

Current mailing address (House/Apartment Number, Street, P.O. Box/Rural Route) City State Zip Code County

Permanent address, if different from above (Street, P.O. Box/Rural Route) City State Zip Code County

Personal phone Work phone E-mail address

( ) ( )

Are you a resident of Minnesota? Yes No If yes, how long? \_\_\_\_\_ years \_\_\_\_\_ months If no, of which state are you a resident? \_\_\_\_\_

Are you a U.S. citizen? Yes No

If you answered no, do you have status as: Resident alien Refugee/asylee Temporary protected status None of these

If you answered none of these, do you have or intend to apply for a visa? Yes No

If you answered yes, you must contact the international student office at the college or university you wish to attend to determine whether a separate application is required.

Answer the following two questions only if you wish to qualify for in-state tuition and are NOT one of the following: a U.S. citizen; an international student maintaining valid immigration status as a non-immigrant; or a permanent resident, refugee or have been granted temporary protected status:

When you graduate from high school, will you have attended a high school in Minnesota for three or more years? Yes No

To qualify for resident tuition under the Prosperity Act, male students between the ages of 18 and 25 must have registered with the Selective Service System. Please indicate one of the following: I have registered with Selective Service I have not registered with Selective Service I am not required to register for Selective Service

What is the highest level of education for your parent(s)/guardian(s)? Please respond for the parent(s), step-parent(s), adoptive parent(s) or guardian(s) who raised you. Check only one box for each parent/guardian.

Parent/Guardian #1

No high school diploma High school diploma Some college Two-year college degree/diploma Bachelor's degree or higher Not sure/don't know

Parent/Guardian #2

No high school diploma High school diploma Some college Two-year college degree/diploma Bachelor's degree or higher Not sure/don't know

**ADMISSIONS INFORMATION**

Name of Minnesota state college or university to which you are applying (use a separate copy of the application form for each institution)

Name of program, major or curriculum you plan to follow; e.g. English, electrical engineering, auto mechanics, nursing. Write "undecided" if you are, but indicate any alternatives you are considering. (Check college/university policies for admission requirements to specific programs of study. List up to three.

What is your current educational intent at this institution?

Complete courses, but not a degree Earn associate (two-year) degree Earn associate (two-year) degree and transfer  
Earn occupational certificate/diploma Complete courses and transfer without a degree Earn bachelor's (four-year) degree

What term do you intend to begin taking courses? (Check only one and indicate the year)

Fall \_\_\_\_\_ Spring \_\_\_\_\_ Summer I \_\_\_\_\_ Summer II \_\_\_\_\_ Summer III \_\_\_\_\_

Do you plan to attend: Full time? (12 or more credits) Part time? (fewer than 12 credits)

Have you attended this college/university before? Yes No If yes, last date attended: \_\_\_\_\_

Activities/interests: (optional) Please list \_\_\_\_\_

Are you now serving, or have you ever served, in the United States armed forces? Yes No

#### DEMOGRAPHIC INFORMATION

The following information will help Minnesota State Colleges and Universities evaluate student recruitment and retention policies; it will not be used as a basis for admission. Providing this information is voluntary.

Gender Male Female

Are you Hispanic or Latino (a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture, regardless of race)? Yes No ~~Racial~~ Racial background (select one or more)

American Indian or Alaska Native - A person having origins in any of the original peoples of North and South America (including Central America) who maintains cultural identification through tribal affiliation or community attachment.

Asian - A person having origins in any of the original peoples of the Far East, Southeast Asia or the Indian subcontinent.

Black or African American - A person having origins in any of the black racial groups of Africa.

Native Hawaiian or Other Pacific Islander - A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

White - A person having origins in any of the original peoples of Europe, the Middle East or North Africa.

Application continues on next page

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#### EDUCATIONAL INFORMATION

Do you have a high school diploma? Yes No High school graduation date: \_\_\_\_\_

If no, do you have a GED? Yes No Are you currently in high school? Yes No

High school attended City State Zip

List any other post-secondary institutions attended Official transcripts from each institution attended must be sent directly to the Admissions Office of the college/university.

College/University/Institution City State Dates of attendance Degrees earned

College/University/Institution City State Dates of attendance Degrees earned

College/University/Institution City State Dates of attendance Degrees earned

Are you a high school student planning to take college courses under the Minnesota Post-Secondary Enrollment Options program (PSEO)? Yes No

If yes, please contact your high school counselor and also the admissions office of the college/university you plan to attend.

#### SIGNATURE REQUIRED BY ALL APPLICANTS

All of the information included is true and complete to the best of my knowledge.

Applicant's signature Date

#### HIGH SCHOOL PREPARATION STANDARDS FOR MINNESOTA'S STATE UNIVERSITIES

STATE UNIVERSITY APPLICANTS ONLY – PLEASE COMPLETE

Students graduating from high school in 1994 or later must meet preparation requirements for admission/transfer to Minnesota state universities.

Please list coursework that will be completed by graduation from high school.

Number of Years (or fraction thereof):	ELECTIVES
ENGLISH	(Minimum of 1 year of either visual or performing arts)
(Minimum of 4 years, including composition, literature and speech)	Visual arts _____ Years
English Total _____ Years	Music _____ Years
MATHEMATICS (Minimum of 3 years, including 2 years of algebra, one of which is intermediate or advanced, and 1 year of geometry)	Theater/Drama _____ Years
Elementary algebra _____ Years	Dance _____ Years
Intermediate algebra _____ Years Advanced algebra _____ Years	Media arts _____ Years
Geometry _____ Years	Electives Total _____ Years
Trigonometry _____ Years	
Pre-calculus _____ Years	
Other _____ Years	
Mathematics Total _____ Years	

SCIENCES (Minimum of 3 years, including at least 1 year each of a biological and physical science with significant laboratory experience in all courses)

Biological science with lab \_\_\_\_\_ Years

Physical sciences with lab \_\_\_\_\_ Years

Physics with lab \_\_\_\_\_ Years Chemistry with

lab \_\_\_\_\_ Years Other with lab \_\_\_\_\_ Years

Science Total \_\_\_\_\_ Years

Number of Years (or fraction thereof):

SOCIAL STUDIES

(Minimum of 3 years, including 1 year each of geography and U.S. history)

U.S. history \_\_\_\_\_ Years

Geography \_\_\_\_\_ Years

Other \_\_\_\_\_ Years

Social Studies Total \_\_\_\_\_ Years

WORLD LANGUAGE (Specify)

\_\_\_\_\_

(Minimum of 2 years of a single world language, including non-English native languages and American Sign Language)

World Language Total \_\_\_\_\_ Years

#### **HIGH SCHOOL/GED TRANSCRIPT**

#### **RELEASE PERMISSION**

#### **Note to applicant:**

Tear off, sign and send or give directly to the last high school attended. Your transcript cannot be sent without signed permission.

I,

\_\_\_\_\_

hereby request

\_\_\_\_\_

to send a high school transcript, GED record, and/or IEP to:

Name of college/university and campus

Address

City State Zip Code

Applicant's signature Date

**Transcript Information:**

Name used on school transcript

Year graduated or last attended

Date of birth Social Security number |

This information will be used only to verify the correct identity of the student

Parent's signature (if under 18) Date

## Appendix D: Correlation Test Results Spearman and Kruskal Wallis – SPSS

### Output Tables

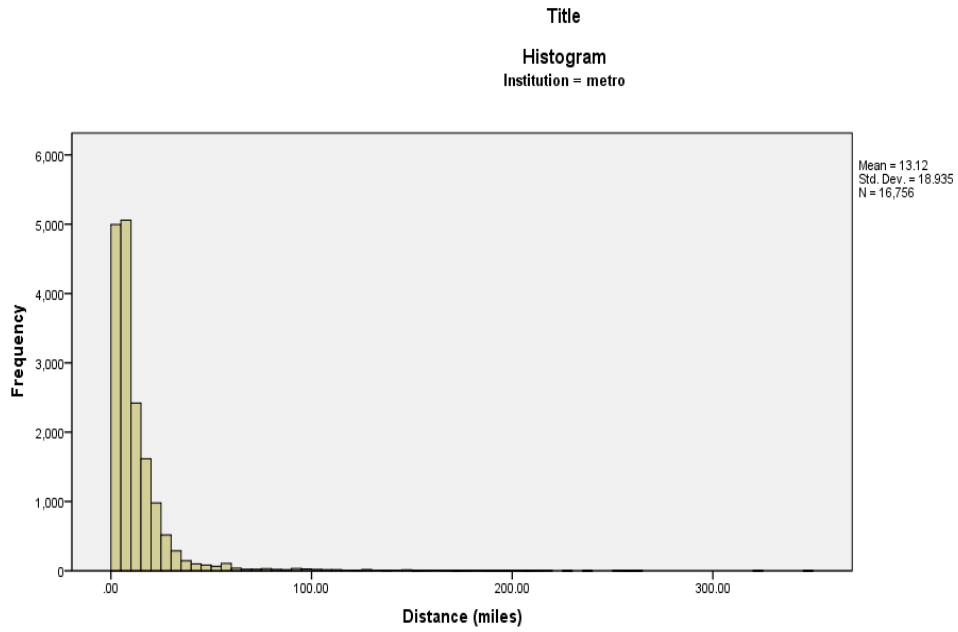


Figure D1. Histogram of institution metro and proximity home to college.

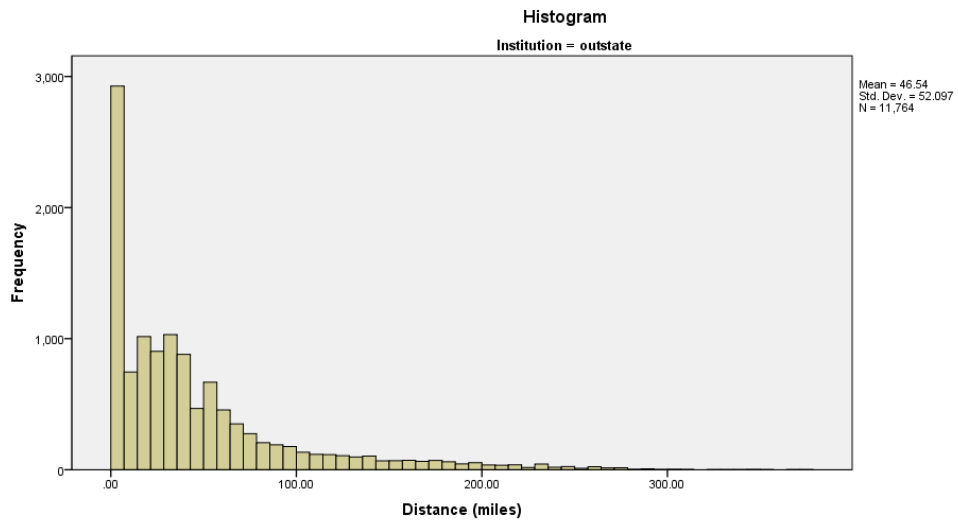


Figure D2. Histogram of proximity home to college and institution outstate.



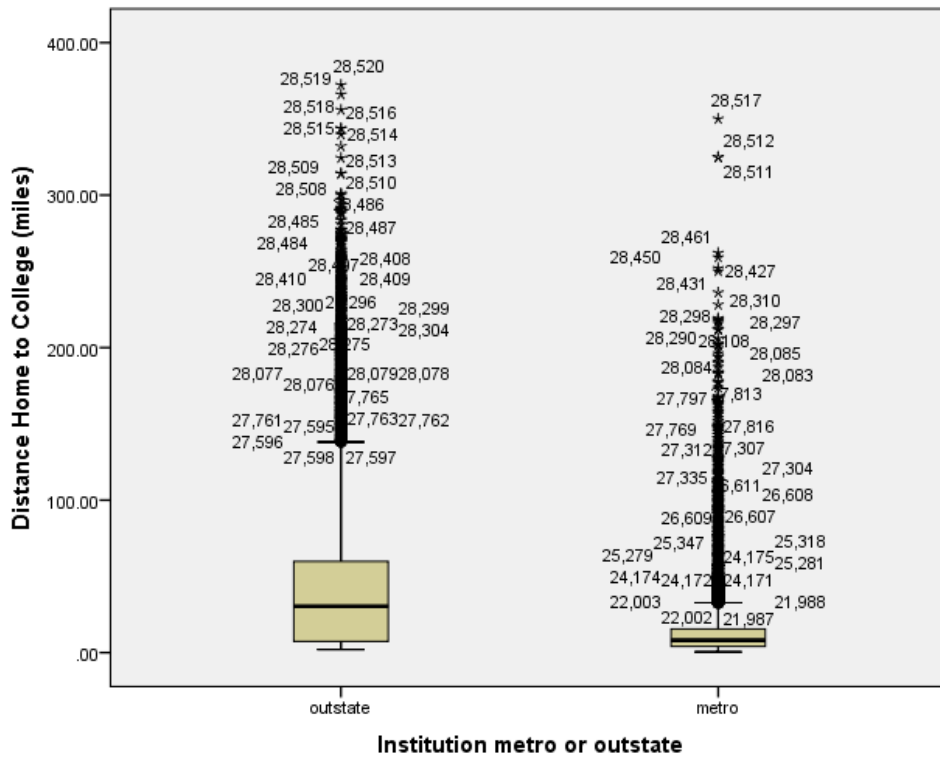


Figure D3. Boxplot of Proximity home to college and Institution outstate or metro.

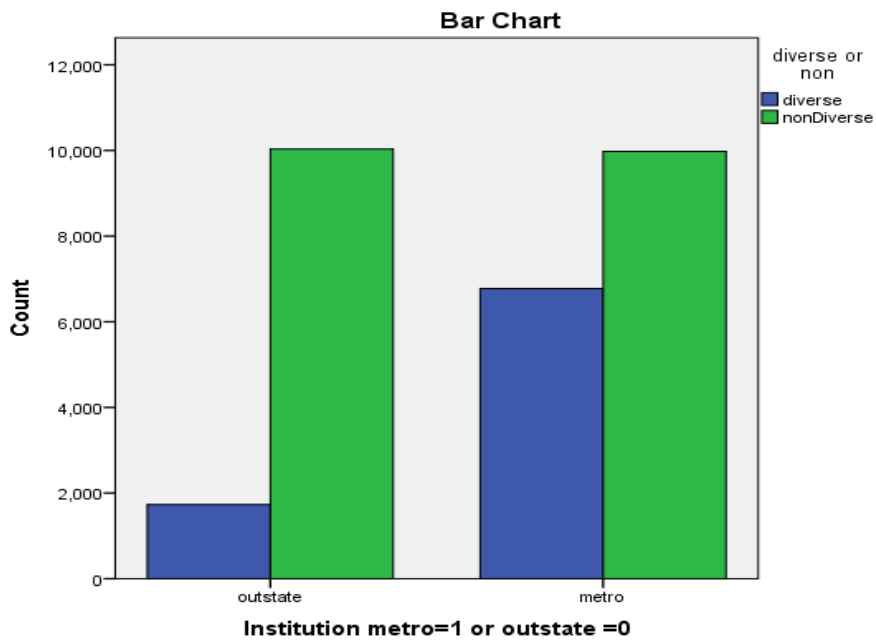


Figure D4. Metro and Outstate Diversity.

### **Kruskal-Wallis Rank Sum Test**

A Kruskal-Wallis rank sum test was conducted to assess if there were significant differences in Proximity home to college between the levels of Gender. The results of the Kruskal-Wallis test were not significant,  $\chi^2(1) = 1.96, p = .161$ , indicating that the mean rank of Proximity home to college was not significantly different between the levels of Gender. Table 1 presents the results of the Kruskal-Wallis test.

Table D1.

*Kruskal-Wallis rank sum test for Proximity home to college by Gender*

<i>Variable</i>	<i>Mean Rank (male)</i>	<i>Mean Rank (female)</i>	$\chi^2$	<i>df</i>	<i>p</i>
Gender	14290.11	14153.40	1.96	1	.161

### **Kruskal-Wallis Rank Sum Test**

A Kruskal-Wallis rank sum test was conducted to assess if there were significant differences in Proximity home to college between the levels of Diversity. The results of the Kruskal-Wallis test were significant,  $\chi^2(1) = 1582.77, p < .001$ , indicating that the mean rank of Proximity home to college was significantly different between the levels of Diversity. Since the overall test was significant, pairwise comparisons were examined between each level of Diversity. The results of the multiple comparisons indicated significant differences for the following comparisons: (non diverse-diverse). Table 2 presents the results of the Kruskal-Wallis test. Table 10 presents the results of the pairwise comparisons.

Table D2.

*Kruskal-Wallis rank sum test for Proximity home to college by Diversity*

<i>Variable</i>	<i>Mean Rank (non diverse)</i>	<i>Mean Rank (diverse)</i>	$\chi^2$	<i>df</i>	<i>p</i>
Diversity	15525.21	11286.71	1582.77	1	< .001***

Table D3.

*Pairwise comparisons for the mean ranks of Proximity home to college by the levels of Diversity*

<i>Comparison</i>	<i>Observed Difference</i>	<i>Critical Difference</i>
non diverse-diverse	4238.50	208.83

**SPSS® Version 22.0-** Statistical Package for the Social Sciences, a statistical software package initially released in 1968, acquired by IBM in 2009, it is designed to allow non-mathematicians to run descriptive, bivariate, predictive and factor analysis statistics by way of pre-formatted menus or with syntax command language.

**Intellectus Statistics™ Version 1.01-** a proprietary web-based statistical software package distributed by Statistics Solutions Inc., it is designed to allow researchers to run statistical tests walking the user from data management through statistical computation in common language by way of online user interface and results output in Microsoft Word document format instead of charts exported into Microsoft Xcel.

**Appendix E: Frequency Tables – SPSS Outputs**

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Parental Educational Level	27053	2	6	4.52	1.267
Proximity home to college	28520	.01	372.18	23.0185	36.90564
Institution metro or outstate	28520	0	1	.59	.492
Applicant Educational Intent	28057	1	5	3.00	1.144
Gender	28452	0	1	.53	.499
Diversity	28520	0	1	.70	.458
Valid N (listwise)	26622				

**Parental Educational Attainment Level**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no high school diploma	1566	5.5	5.8	5.8
	high school diploma	5486	19.2	20.3	26.1
	some college	5528	19.4	20.4	46.5
	two year degree	6321	22.2	23.4	69.9
	baccalaureate	8152	28.6	30.1	100.0
	Total	27053	94.9	100.0	
Missing	blank	528	1.9		
	don't know	939	3.3		
	Total	1467	5.1		
Total		28520	100.0		

**Frequency Tables**

**Applicant Educational Intent**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	courses only	1236	4.3	4.4	4.4
	certificate	9034	31.7	32.2	36.6
	AS AAS	12036	42.2	42.9	79.5
	courses and transfer	86	.3	.3	79.8
	two year degree and transfer	5665	19.9	20.2	100.0
	Total	28057	98.4	100.0	
Missing	blank	463	1.6		
Total		28520	100.0		

**Gender**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	female	13238	46.4	46.5	46.5
	male	15214	53.3	53.5	100.0
	Total	28452	99.8	100.0	
	missing	68	.2		
	Total	28520	100.0		

### Race or Ethnicity

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid diverse	8510	29.8	29.8	29.8
non-diverse	20010	70.2	70.2	100.0
Total	28520	100.0	100.0	

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Parental Educational Level	27053	2	6	4.52	1.26
Proximity home to college	28520	.01	372.18	23.01	36.90
Institution metro or outstate	28520	0	1	.59	.492
Applicant Educational Intent	28057	1	5	3.00	1.14
Gender	28452	0	1	.53	.499
Diversity	28520	0	1	.70	.458
Valid N (listwise)	26622				

### Institution metro or outstate

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid outstate	11764	41.2	41.2	41.2
metro	16756	58.8	58.8	100.0
Total	28520	100.0	100.0	

## Appendix F: Crosstabulations

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Parental Educational Attainment Level * Applicant Educational Intent	26649	93.4%	1871	6.6%	28520	100.0%

### Parental Educational Attainment Level \* Applicant Educational Intent Crosstabulation

Count

		Applicant Educational Intent		
		courses only	certificate	AS AAS
Parental Educational Attainment Level	no high school diploma	49	531	635
	high school diploma	151	1871	2539
	some college	233	1779	2321
	two year degree	306	1917	2814
	baccalaureate	387	2308	3202
Total		1126	8406	11511



**Parental Educational Attainment Level \* Applicant Educational Intent  
Crosstabulation**

		Applicant Educational Intent		
		courses and transfer	two year degree and transfer	
Parental Educational Attainment Level	no high school diploma	3	337	1555
	high school diploma	7	828	5396
	some college	10	1122	5465
	two year degree	24	1127	6188
	baccalaureate	41	2107	8045
Total		85	5521	26649

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Parental Educational Attainment Level * Institution metro or outstate	27053	94.9%	1467	5.1%	28520	100.0%
Parental Educational Attainment Level * Gender	27025	94.8%	1495	5.2%	28520	100.0%
Parental Educational Attainment Level * Diversity	27053	94.9%	1467	5.1%	28520	100.0%

### Parental Educational Attainment Level \* Institution metro or outstate Crosstabulation

Count

		Institution metro or outstate		Total
		outstate	metro	
Parental Educational Attainment Level	no high school diploma	423	1143	1566
	high school diploma	2269	3217	5486
	some college	2176	3352	5528
	two year degree	3183	3138	6321
	baccalaureate	3045	5107	8152
Total		11096	15957	27053

**Parental Educational Attainment Level \* Gender Crosstabulation**

Count

		Gender		Total
		female	male	
Parental Educational Attainment Level	no high school diploma	795	770	1565
	high school diploma	2719	2762	5481
	some college	2748	2774	5522
	two year degree	3020	3295	6315
	baccalaureate	3359	4783	8142
Total		12641	14384	27025

**Parental Educational Attainment Level \* Diversity Crosstabulation**

Count

		Diversity		Total
		diverse	non-diverse	
Parental Educational Attainment Level	no high school diploma	1219	347	1566
	high school diploma	1941	3545	5486
	some college	1819	3709	5528
	two year degree	1267	5054	6321
	baccalaureate	1719	6433	8152
Total		7965	19088	27053