Spring 2021

The Effects of Higher Education on Socioeconomic Mobility: A Comparative Analysis of Outcomes at Bucknell University

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THE EFFECTS OF HIGHER EDUCATION ON SOCIOECONOMIC MOBILITY: A COMPARATIVE ANALYSIS OF OUTCOMES AT BUCKNELL UNIVERSITY

by

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A Proposal Submitted to the Honors Council

For Honors in Economics

22 April 2021

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Acknowledgements

I want to thank my advisor, Professor Geoff Schneider, for his guidance and support in helping me develop the idea behind this thesis and providing me with feedback and encouragement throughout the entire process. I would also like to thank my second reader, Professor Erdogan Bakir, and my Honors Council Representative, Professor Mehmet Dosemeci, for taking the time to read and evaluate my research. Thanks to Professor Janet Knoedler, Carrie Pirmann, and Ken Flerlage for their help in collecting the original data and trusting me throughout this process and providing additional insight on the analytics software tools and models. I would also like to thank the many additional people from whom I sought additional advice, guidance, and assistance; without them, this thesis would not be possible. Finally, I would like to thank my family and friends for their continuous support and encouragement throughout this entire process.

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Abstract

Income inequality and the lack of higher-education opportunities across the United States often correlate with families' socioeconomic status. In this honors thesis, the following questions will be examined: How does the social mobility of Bucknell Students compare with students from other national universities? How do a student's race and financial aid status affect their ability to achieve social mobility? How has the rate of social mobility through Bucknell changed in recent years? How does a student's current family socioeconomic status affect their ability to achieve high-income success upon graduation? Does the level of accessibility to Bucknell change when socioeconomic status and race are analyzed? What lessons can we learn from countries with high levels of social mobility and economic equality? By utilizing national university data from Opportunity Insights and data from Bucknell University's Offices of Admissions, Registrar, and Financial Aid, this paper examines the ability of higher education institutions to promote social mobility for low-income students. This study finds that the ability for students to achieve high levels of economic success is relatively consistent among all students attending an elite institution. However, the low rates of social mobility at elite institutions are due to the limited number of low-income students admitted to the University. Further, this study finds that the ability to increase accessibility through generous financial aid support can significantly impact a university and a country's ability to promote economic equality. The results indicate strong relationships between financial aid programs, college access, and social mobility, therefore supporting potential policy interventions that devote more attention to providing low-income students financial aid to increase their ability to apply and attend college and achieve upward mobility upon graduation.

1. Introduction

A college degree is one of the leading factors contributing to successful careers and long-term financial gain, yet much of the population of the United States does not have the opportunity to attend universities. Access to affordable higher education in the United States has recently become an extremely controversial topic in many social and political debates. College tuition is consistently rising faster than inflation, and the competition to receive a degree from a quality institution is intensifying (Bennet 2014). While the debate over equal opportunity has caused polarization in the United States, many higher education institutions have claimed that they offer all prospective students a level playing field in the admissions process. However, universities are accused of disregarding unequal socioeconomic backgrounds of their applicants, possibly reinforcing the racial and economic inequalities already present in society. Some studies indicate that American private universities are less accessible to students from financially diverse backgrounds due to their emphasis on standardized testing scores and GPAs, which tend to reflect socioeconomic status as opposed to pure intellect (Cheslock 2020). Meanwhile, certain European countries have been able to provide an alternative approach to higher education in terms of more equal opportunity and greater social mobility upon graduation (World Economic Forum 2020).

Current literature on the subject of higher education access and inequality reveals a mixture of opinions on the causality of this situation, with some scholars (Thompson 2018, Hoxby and Turner 2015, Koricich 2013) determining the inequalities are based primarily on limited resources in lower economic communities. Others (Chetty *et al.* 2017, Corcoran 1995, Terenzini 2001) believe inequality is a result of higher education institutions failing to prioritize

providing individuals from poor socioeconomic backgrounds with equal access and opportunity. Without a definitive cause and effect-based relationship, it is hard to determine what adjustments schools and universities should make to help underprivileged students. However, the drastic differences between institutions across the United States raise questions about effective and consistent education-based policies. Due to this gap in current literature, this thesis intends to investigate whether or not Bucknell University and other universities across the United States foster social mobility or if they reinforce the cycle of socioeconomic inequality.

It is important to look at the factors that influence intergenerational mobility and a student's chances of achieving success after college because of the weight a college degree holds. Students from low-income families attending an elite institution rely on economic mobility as one of the leading factors for attending a particular school, or college in general, with hopes of improving their economic attainment. When a low-income student attends an elite institution, they have a much higher chance of achieving intergenerational income mobility than if they attended a public university (Chetty *et al.* 2017).

Bucknell University, along with many other institutions across the United States, has developed and published a strategic plan, "The Plan for Bucknell 2025: A Thriving, Inclusive and Sustainable Future." The plan outlines a strategic commitment to prioritize building and sustaining a diverse community in which all students, faculty and staff experience a sense of belonging supported by a foundation of inclusion, equity and access (Strategic Plan 2019). The university hopes to achieve this goal through its immediate fundraising priority of increasing need-based financial aid resources during the next comprehensive campaign. With currently limited financial aid resources, compared to many other competing universities, Bucknell hopes to lower comprehensive costs in efforts to recruit a highly qualified and more diverse student

body in the future. The university hopes to increase the school's discount rate to at least 35% to increase need-based aid by the fall of 2025. While the goals of the University depict efforts to increase accessibility and opportunity to a diverse range of students, the financial aid and support may also impact the mobility of lower income students. This study will help ascertain if increasing financial aid efforts will also help the university increase their efforts in promoting equality and successful mobility. Comparing the financial aid programs and student outcomes of institutions that are successful in achieving high rates of mobility will determine if these financial efforts by Bucknell are likely to be successful in achieving their anticipated goals.

This thesis aims to examine how higher education programs enable the continuation or interruption of U.S. socioeconomic inequalities through higher education programs. This analysis will further depict the relationship between national universities and their ability to promote socioeconomic mobility. Further analysis will explore the following questions: Is Bucknell able to successfully promote upward mobility for students from low-income backgrounds? Do certain student indicators or variables encourage a higher level of mobility? Has Bucknell been able to improve their levels of mobility over time?

The remainder of this paper is organized into six sections. Chapter Two reviews the literature on the access to higher education, previous studies on the relationship between educational access and socioeconomic mobility, and the policy implications of these studies. Chapter Three defines and explores the datasets used to calculate the rates and statistics that will be analyzed later in the study. Chapter Four explains the methodology and models used in the study. Chapter Five discusses the results of the comparative and descriptive statistical analysis while providing further evidence on the social mobility rates of other colleges across the United States, across identifying variables that impact the socioeconomic mobility of Bucknell students

and compares these results with the high mobility rates of countries such as Denmark, Norway, Finland, and Sweden. Chapter Six addresses the limitations of the study. Chapter Seven summarizes the overall findings while exploring future potential studies that can build off the conclusions from this research. The Bibliography presents all used materials and references for this paper. The Appendices display a number of tables and graphs helping explain the existing data and statistics used in the analysis.

2. Literature Review

The following chapter will explore literature studying the impact of national social mobility trends across the United States, access for all students to attend higher education institutions, and current university and national policies. International trends in social mobility and university policies will also be reviewed across Nordic countries due to their status promoting high levels of economic equality. Unequal opportunities and low rates of social mobility across the United States are often criticized as a result of the disproportionate number of students who have access to higher education. With students from low-income backgrounds being unable to have the financial support to attend expensive, elite universities they are already at a disadvantage when thinking about college. Government and university policies have the opportunity to encourage students across all backgrounds to achieve high levels of education. However, compared to universities in other countries that promote equal opportunity and access through free education, the United States pushes for students to attend expensive private universities for future economic success regardless of their financial or social ability to afford school. The analysis of Nordic countries will consider how these countries have been able to promote equal opportunities among their all students. Existing literature and studies about social mobility and equal opportunity can help connect and compare national and international universities to the data collected from Bucknell University in the following chapters.

2.1 Social Mobility Trends in the United States

The study of intergenerational socioeconomic mobility has increased in importance in recent years due to the political and social implications of inequality across the United States. Inequality has increased dramatically in recent years (Kim *et al.* 2019), and one of the questions confronting researchers is the extent to which the increase in inequality may have eroded

intergenerational mobility. The patterns and trends developed by economists identify a select set of variables to be significant predictors of the opportunity for mobility an individual can hope to achieve. The standard measure of intergenerational mobility is based on the international elasticity: a regression coefficient showing the percentage change in a child's income associated with a percentage change in parental income (Landersø *et al.* 2016). Existing literature proposes that the key variables in determining intergenerational mobility include, but are not limited to, race, gender, location, and parental income.

Students are regularly characterized and separated based on their specific demographics such as their racial identity or parent's socioeconomic status when trying to predetermine their possible socioeconomic statuses in adulthood. Numerous studies (Chetty *et al.* 2017, Corcoran 1995, Terenzini 2001) prove these simple identifying factors can have a dramatic impact on the level of mobility a child is likely to achieve in the future. Children from nearly identical backgrounds, besides race, will still diverge economically as adults as suggestive evidence from employer surveys and audit studies provides evidence of race-based discrimination (Corcoran 1995). Structural racism plays a large role in the unequal distribution of success as modern society still provides substantial benefits to white individuals compared to their minority counterparts. This continuity of structural racism coincides with the persistent levels of low socioeconomic status for minorities across the United States. From birth through their adult life, minorities face levels of discrimination from receiving lower wages for the same job to overall unequal treatment and opportunities due to their demographic.

While other factors such as location and parental income play a similar role in defining the level of mobility achievable for children, race has been proven to hold the strongest influence. Controlling for background can completely eliminate white children's schooling

advantage and in several studies “once background disadvantages are controlled, blacks usually acquire more schooling than do whites” (Corcoran *et al.* 1987; see also Mayer 1991, Haverman *et al.* 1991). Black students can acquire more schooling than their white counterparts when receiving the same financial and social support to attend school. This is inconsistent with the argument that black children are less motivated to stay in school than are white children for ‘cultural’ reasons” (Corcoran 1995). There are many misconstrued beliefs about minority student schooling including the idea that these students do not want to stay in school resulting in their lower level of education. However, it can be proven that a student’s background and environment is a better predictor than their race when determining the amount of schooling they will receive (Corcoran *et al.* 1987). The geographic location and economic status of a child are more telling variables that determine their chances at applying or attending a university than their ethnic background. These barriers can prevent a student from affording college due to their financial background or physical distance from a school.

Studies with regard to the relocation of students from public housing to city to suburban private apartments have presented a correlation between the effect of a child’s location and opportunity for mobility. When comparing these groups of students through Chicago’s Gautreaux experiment, Rosenbaum *et al.* found children in suburban homes were far less likely to drop out of high school while being noticeably more likely to attend college and receive future employment with higher earnings (Rosenbaum *et al.* 1991). As this study focused on black public housing, it can be applied to black students, demonstrating that the location students grow up has a significant impact on their outcome in life. However, regardless of the conclusive trends on mobility, there continue to be controversial issues behind relocation studies and the impact of selection bias. While racial, geographic, and financial variables cannot be completely excluded,

the reduction in selection bias from these variables persuades researchers to believe the physical mobility theory holds enough plausibility to be applied to any race (Corcoran *et al.* 1987, Mayer 1991, Haverman *et al.* 1991). The geographic and financial background of a student are more important in determining their future education status than their race according to these studies.

Intergenerational mobility continues to pique the interest of many economists as the political and social agenda presents a concern that socioeconomic mobility is consistently declining as income inequality increases. This leaves many researchers questioning if there is significant socioeconomic mobility across the United States. Raj Chetty *et al.* (2014) argue that the key issue is not just the declining rates of mobility, but the lack of mobility offered for citizens when compared to other developed nations. This correlates with the research finding that the location where a child is raised has a high impact on their chances of achieving mobility in the future when comparing individuals born in affluent versus deficient regions of the country.

Chetty has produced some of the most comprehensive studies on intergenerational mobility while analyzing the correlations between student data and parental tax records. Yet, census data repeatedly shows stability in the measures of intergenerational mobility while income inequality has continuously increased over time (Chetty *et al.* 2014). The consequences of the "birth lottery," the parents to whom a child is born, are greater than ever before. Economists use the analogy of a ladder when depicting the national income distribution between percentile groups between steps. "The rungs of the ladder have grown further apart (inequality has increased), but children's chances of climbing from lower to higher rungs have not changed (rank-based mobility has remained stable)" (Chetty *et al.* 2014 141).

2.2 Access to Higher Education

One of the most prevalent issues in American society continues to be the lack of equal access to higher education despite the influence a college degree has on an individual's economic success. Variables that impact college admissions and enrollment include family income, parental education, and accurate information about a college degree. These factors have been analyzed in past studies to determine their impact on the probability of a student applying to and attending various forms of higher education.

Parents under significant financial stress do not tend to prioritize education over more immediate necessities, reinforcing the argument that students from ranging socioeconomic backgrounds have different levels of access to higher education. "Parents allocate income between current consumption and investments in children's human capital (e.g. schooling). They have little time, money, or energy to devote to developing children's human capital or earnings potential" (Corcoran 1995 242). Not only does financial stress create a burden on the family's ability to pay for college, but the students who do apply to college end up basing their decisions on their family income rather than individual achievement levels (Hoxby 2013). These students' perceptions about their familial socioeconomic status often inhibit their aspirations of attending selective colleges or universities.

In contrast, highly educated parents encourage their children to believe in higher expectations and goals including applying to elite colleges. Subsequently, these students will likely graduate from college and receive a well-paying job in the future (Dubow 2009). With a college degree, it is extremely likely that these parents come from a high socioeconomic background and therefore have the means to afford tuition at elite institutions across the United States. Sending these affluent students to selective schools with strong networking connections

to companies and graduate schools protects the socioeconomic status of these high-income families in the future. This creates a direct correlation between the educational attainment of parents and the probability a child will apply to and enroll in a high education institution.

Students from lower socioeconomic levels cannot afford the same expensive, elite schools as their wealthy peers putting them at a disadvantage before they can even apply to college (Dale *et al.* 2002). Dale *et al.* (2002) demonstrated a positive correlation between tuition and expenditure per student due to higher average tuition costs leading to higher income levels after college. Another study analyzed how wealthy schools, determined by endowment per student, were able to reduce net prices to the lowest levels and as a result have experienced the largest increases in numbers of low-income students (Hill *et al.* 2011). Yet this study determined that while lower income students are asked to pay a lower net price and share of the full tuition price, the cost represents a much higher share of their family incomes than wealthier students. However, elite and selective institutions have high value-added rates per student, due at least in part to increased spending rates for students, triggering wealthy students to spend more money to attend these schools (Hoxby 2015). High value-added rates for students are due to the number of resources available that contribute to the future economic success of students upon graduation.

While wealthier institutions have increased their affordability, the direct access to these elite schools has not changed significantly. Using standardized national testing, SAT and ACT scores, to determine high ability students, McPherson and Schapiro (2006) found that low-income students are underrepresented at wealthy schools by around 30% compared to their fellow peers. While these methods of measuring achievement through testing are controversial, they can be cautiously used to demonstrate the barriers low-income students face as schools do not use proportional representation when admitting an incoming class. Furthermore, high-

achieving, low-income students have additional obstacles with regard to access to information about college, regardless of effectiveness of their college counselors or university admissions teams. Not understanding financial aid, the net price of college, the locations of schools, the liberal-arts style curriculum, or the overall resources that can help prepare them for college can hinder their application and matriculation choices (Hoxby and Turner 2015). Lacking helpful and accurate information results in students making uninformed decisions that may harm their chances at a desirable future. When misinformation changes students' understanding about financial aid, low-income students often give up their hopes of attending college or applying to schools to protect the finances of their families (Terenzini *et al.* 2001).

While many factors influence the level and chances for mobility, higher education may give an individual the strongest chance at achieving this goal. Another factor that can often influence mobility is the major a student chooses to study. Individuals select a college major based on a variety of factors including expected earnings, patterns of labor force participation, uncertainty, non-price preferences, and the likelihood of graduation (Montmarquette *et al.* 2002). However, without the proper information about the implications of this decision, lower-income students might not have the proper resources to complete a more demanding major, resulting in the pursuit of a major with a lower starting salary. For example, natural science, engineering, and economics courses are more rigorous with longer study times and harsher grading curves than their social science and humanities counterparts (Thompson 2018).

2.3 Impact of National and University Policies

The socioeconomic status of a student’s family has a strong influence on their future mobility opportunities and access to higher education. However, the precedents set by

universities and United States national policy makers have the ability to play a significant role in improving these substantial inequalities.

A variety of financial aid sources can help students pay for college from federal, state, school, or private sources in the form of grants, work-study, loans, and scholarships. The possibility of supplementing federal and state financial policies has the ability to increase accessibility when applying to college (Terenzini 2001). Studies show that the percentage of family income used to pay for college has increased over the years, particularly for low-income families; this is partly due to the declining wages and incomes of low-wage workers (Mishel *et al.* 2015). The Federal Pell Grant program, currently the nation's largest need-based grant program, was designed to ensure that students experienced greater access to college. However, the number of grants given to students in the bottom income bracket has decreased dramatically as a percentage of tuition as college costs continue to rise (Ficklen *et al.* 2002). This may be due to the priorities of federal, state, and university policy makers focusing on increasing the affordability of middle-class and merit students (Advisory Committee 2001). This results in many lower income students withdrawing their plans to attend college full-time or completely.

Financial aid options often weigh heavily on a student's choice of school, especially when considering out-of-state options (Vergonlini 2015). Vergonlini's (2015) study also concluded that financial policies focused on merit and financial need have the ability to reduce inequalities in the access to specific institutions and fields of study. Financial aid plays a large role in determining if and where a student goes to college, supporting the belief that positive intervention, through financial aid, early in a student's educational career can help them achieve postsecondary success (Hu 2003). Cost-based recommendations have been made promoting federal and state government interventions such as protecting nontraditional students' eligibility

for Pell Grant funding; providing low-income students with increased information about college costs and financial aid; helping students access additional financial support through local and national initiatives; and changing the funding allotment in the Federal Work Study Program to provide more benefits to students (Advisory Committee 2001). Beyond financial support and aid, it is important for institutions to implement supportive educational resources centered around academic assistance and career guidance. Engaging students from rural locales can be achieved through federal and state targeted grant programs supporting dual enrollment programs between vocational and traditional degrees or additional unique curricula (Koricich 2013).

Federal and state government initiatives are important to achieve extensive transformation, yet college-specific initiatives are equally important when promoting equal opportunities among a student body. Bowen *et al.* (2006) urges elite institutions to apply an individualized and holistic approach to college admissions decisions. Specifically, he suggests that low-income students be offered the same additional consideration given to legacy applicants to balance the number of legacy and low-income or first-generation applicants. This can help ensure equity of opportunity rather than giving favor solely to those who are already advantaged.

Bucknell University has committed to achieving equitable access as it is a critical component of the University's promise to its students as it relates to admission to Bucknell and academic experiences. The University has committed to identifying and addressing structural, institutional and cultural factors that create barriers to equitable access (Bucknell Strategic Plan 2019). While Bucknell has actively committed to expanding diversity, of all forms, the student body has more students from the top one percent of the income distribution than the bottom sixty percent (Chetty 2017).

Selective and wealthy colleges have the ability to positively affect the lives of low-income students compared to the resources and opportunities provided at public and lower tiered institutions (Chetty 2017). This should entice policy makers at elite universities to increase access for students who would benefit most from a distinguished degree. However, these institutions usually continue to uphold the privilege of their student bodies by conserving the high percentage of top one percenters and maintaining barriers of access for the bottom sixty percent (Chetty 2017). By promoting active policy changes, these selective institutions can provide the proper support and resources for students who would benefit from upward mobility and further develop the narrative that these schools can make a positive difference in everyone's lives. While elite schools continuously declare their commitment towards aspiring for greater diversity and equality among their entire student body by admitting minority and low-income students, the results of these claims are ambiguous at best.

2.4 International Trends in Social Mobility

As trends in intergenerational mobility across the United States seem to be hindered by a number of racial, economic, and political factors, many Nordic countries focused on providing equal opportunities for all citizens, which has resulted in positive trends in their socioeconomic mobility. The social mobility levels of the United States are far lower in comparison to Scandinavian countries with many scholars pointing out the benefits of the welfare state and its generous support of high-quality childcare and education for all Scandinavian citizens. These benefits include free college tuition, easy access to childcare, generous maternity and paternity leave, and free or almost free pre-kindergarten programs (Landersø *et al.* 2016). Yet, despite these policy differences, the influence of family background on educational attainment is still present in Scandinavia. Across these European countries, there is a significant wage premium

associated with highly educated families, while there is a penalty with being raised in a lower-educated family, even after controlling for other variables (Causa *et al.* 2009). In addition, intergenerational wage persistence, measured as the difference between the wage premium and penalty, is slightly stronger for sons than daughters, following the increased education and labor force opportunities. While there continues to be a stagnation in the upward mobility of citizens across the world, the United States in comparison to European Nations falls behind in promoting the upward mobility of individuals and families at the bottom of the income distribution.

The Intergenerational Elasticity (IGE) in income is used to focus on cross-country differences in intergenerational mobility. Plotting the IGE against the Gini coefficient, often cited as the "Great Gatsby" curve, is a useful visual summary of income mobility, however, this does create limitations when focusing on one parameter of wages. For example, this does not provide ample evidence about the differences between upward and downward mobility or the differing mobility points along with income distribution (Bratberg *et al.* 2016). Aaberge and Mogstad (2014) developed a variant framework to measure mobility using the difference between two Lorenz curves: the true Lorenz curve, which measures the permanent income distribution, and a "reference" Lorenz curve, corresponding to the counterfactual permanent income distribution assuming no intra-generational income mobility. This study of economic mobility alongside the extensive literature on inequality and social welfare (Atkinson 1970) offers ample evidence on the intergenerational mobility in Norway, Sweden, and Germany in comparison to the United States. The results demonstrate that families starting at higher percentiles in the income distribution experience smaller increases in absolute income over a generation compared to families of lower percentiles. Among children who start in the bottom decile of the parental income distribution, income is expected to increase by 32 percent of

average income in Germany, 40 percent in the US, 46 percent in Norway, and 49 percent in Sweden (Bratberg *et al.* 2016). Corak *et al.* (2014) also found lower absolute income gains among those at the bottom of the distribution who experienced upward mobility when comparing the US with Sweden.

Compared to Scandinavian countries, the United States exhibits both less upward mobility from the bottom of the distribution and less downward mobility at the top of the distribution. With other countries offering many welfare policies to promote the advancement of education and cognitive skills for disadvantaged children, the US has difficulty competing with these counties' emphasis on equality for all citizens. As these countries are characterized by high-income equality and well-developed welfare states, many believe this is due to their focus on reducing the importance of the family background. Empirical research reveals that mobility has increased over time in Nordic countries and the increase is far higher for lower-earning families (Bratberg *et al.* 2007). This directly correlates to policies intending to remove financial constraints as well as additional pressures in the form of influence of family on their offspring's preferences and opportunities. This is an indication of the notion of equality of opportunities in Nordic society, which can be traced to the implementation of numerous school reforms and increased grants and loans as instruments to increase educational attainment.

The Global Social Mobility Index (2020) produced by the World Economic Forum provides a holistic assessment of 82 global economies according to their performance in five dimensions of social mobility: health, education, technology, work, and protection and institutions. Denmark (85.2), Norway (83.6), Finland (83.6), Sweden (83.5), and Iceland (82.7) are scored as countries closest to the ideal state. They combine access, quality, and equity in education, while also providing work opportunities and good working conditions, and providing

quality social protection and inclusive institutions. Despite these policy interventions, countries with high levels of relative income mobility continue to see more opportunities for children born into high-income families. However, in Denmark or Finland, if one's parent earns 100% more than another, it is estimated that the impact on a child's future income is around 15%, compared to about 50% in the United States, and 60% in China (World Bank 2018). Thus, the impact of inequality is much more severe in the U.S. and China relative to Denmark or Finland.

In high-income countries, since the 1990s, research has shown stagnation at both the bottom and the top end of the income distribution—a phenomenon which social mobility experts describe as 'sticky floors' and 'sticky ceilings' (OECD 2018). By extrapolating existing social mobility levels, "one can evaluate both the speed (how long it takes for individuals at the bottom of the scale to catch up with those at the top) and intensity (how many steps it takes for an individual to move up the ladder in a given period) of social mobility" (World Economic Forum 2020, 9). The number of generations it takes for a low-income family to reach median income differs significantly in different countries. For example, assuming constant relative social mobility levels in these countries, it would take five generations to reach median income in the US, in comparison to just two in Denmark or three in Sweden, Finland, and Norway (OECD 2018).

The high levels of inequality across the United States have resulted in low levels of mobility compared to other countries around the world. As the leading countries in social mobility, Denmark, Finland, Sweden, and Norway can be analyzed to help understand the benefits of a welfare nation in promoting equality among all citizens. Free college tuition, easy access to childcare, generous maternity and paternity leave, and free or almost free pre-kindergarten programs help maintain these efforts of equal opportunity and access. With

increasing rates of students from low-income families achieving high levels of success, Scandinavian countries consistently excel in preserving high rates of mobility compared to declining rates across the United States.

2.5 International Higher Education Policy Implications

Corresponding to the trends in social mobility and wage distribution, there is substantial persistence in educational achievement across generations. The probability of achieving tertiary education is higher for children of higher-educated families than for those of lower-educated families. In Luxembourg, Italy, Finland and Denmark there is a "30% higher chance of achieving a tertiary education if your parents also received a tertiary education compared to parents who only achieved an upper-secondary education" (Causa *et al.* 2009). According to Education at a Glance (OECD 2002) the Nordic countries have the higher education enrollment rates that are the highest of all OECD countries. These enrollment rates average 50 percent in Sweden, 55 percent in Denmark, 60 percent in Norway, and 65 percent in Finland (Palfreyman 2004). Since the 1960s there has been an expansion in the importance of higher education with demographic trends of increased birth rates and the influx of women accepted into secondary and tertiary institutions. The policies of Nordic countries emphasize further support for higher education with both Swedish and Norwegian government documents explaining the importance of leading their nations through the promotion of knowledge (Palfreyman 2004). These policies focus on specific percentage levels of age groups that should achieve higher education as expansion in higher education is justified as an "investment in the future," while the actual policies are designed to solve immediate inequality issues.

Access policy is focused on strengthening relationships between the state and higher education institutions as they continuously move towards decentralization and deregulation

(Neave and van Vught 1991). All Nordic countries, particularly Sweden since 1993, have experienced a move away from centrally determined student numbers, their distribution by degree program, and funding control by the government, resulting in more autonomy for the institutions. Furthermore, scholars point out the generous educational and childcare policies of welfare states such as Denmark help increase future educational mobility and opportunities.

In the intersectionality of class, gender, and other social differences in Nordic higher education, it is critical to understand how some programs and institutions mindfully target specific groups for recruitment (Isopahkala-Bouret *et al.* 2018). The social distinction is apparent in the case of non-traditional students as defined by first-generation students, international students, mature students, or students with low socio-economic backgrounds. While students from privileged families predominately choose transitional programs, these new types of vocationally oriented degree programs offer more inclusive non-university higher education systems among all students (Isopahkala-Bouret 2015). As educational choices reflect the content and form of social capital that students have, this encourages students to expand their expectations of extending their education and occupation opportunities. Furthermore, students with an immigration background have increased access to elite programs, providing diversity, but raising greater challenges. Nordic data on diversity is scarce regarding access and opportunity gaps for racial and ethnic minorities due to controversial European Union immigration policies (Isopahkala-Bouret *et al.* 2018). The size of the student population with an immigration background, the percentage, and trends regarding numbers of access and matriculation are in flux, varying among countries, institutions, and fields of study. While this is an opportunity for recognition and further analysis, this has further promoted the growth of international programs to encourage language teaching and racial equality in the curriculum

(Börjesson *et al.* 2014). The elimination of unequal practices throughout all stages of education and providing welcoming structures and programs of inclusion for non-traditional students can further widen access and educational opportunity in the Nordic region.

Higher education policies help determine accessibility and the degree of opportunity to obtain a quality education. These factors act alongside school-to-work trajectories that have become major policy issues in the European Union due to alarming dropout rates and unemployment rates of young people (European Commission 2018). Different education and welfare systems result in the development of transition policies, reflecting the social expectations of young people and dominant interpretations of "disadvantaged" youth (Pohl and Walther 2007). These transition policies express the set of education, training, employment, and welfare strategies addressing young people's transitions from education to work. Policies include comprehensive, public, and largely non-selective basic education systems, standardized educational routes with some room for individual choices, and relatively high levels of state-finished social security in international terms (Albæk *et al*. 2015). Labor markets across Europe are increasingly inaccessible for certain groups of youths, particularly early school leavers, disabled young people, and migrant youths who lack upper secondary qualifications. This resulted in Nordic countries forming policies and educational practices focused on promoting the opportunities for the "vulnerable" population, encouraging direct, linear transitions into employment, and increasing the supply of skilled labor (Helms Jørgensen *et al.* 2019). Denmark has a higher specificity of vocational qualification and stronger occupational labor markets, yet weaker employment protection and more educational stratification than Sweden and Finland. Both Sweden and Finland have extended internships and introduced apprenticeships in upper secondary education, increasing their regimes' alignment with the Danish. While these welfare

states all value the equality of opportunity among citizens, regardless of economic boundaries, they do rely on different methods of introducing policies. While transition systems offering extensive work-based training provide smoother transitions to employment, they are associated with higher dropout rates and considerable difficulties for ethnic and gender minorities (Noelke 2015). Regardless of these shortcomings, the Nordic countries consistently exceed the education and intergenerational mobility of the United States.

One of the populations experiencing the most discrimination across all countries are the immigrant groups that are consistently overlooked when promoting mobility and equality. While the Nordic countries promote high rates of success and equality through equal access to all levels of education, they also provide immigrants with the same opportunities as their native citizens. The United States receives a large influx of immigrants every year which may be one of the leading factors in the country's low mobility rates. Immigrant, low-income, and undereducated families with little to no professional connections can be supported when government, social, and financial policies focus on integrating them into higher education groups. These Nordic countries have room for improvement in their equality strategies, just like any other nation, however their focus on equal opportunity through financial support consistently allows for higher rates of mobility compared to the United States.

2.6 Existing Gaps in Literature

Existing studies conducted by economists have analyzed the effects of higher education with regard to its impact on upward mobility, return on investment, and the overall accessibility to higher education institutions. However, this honors thesis approaches these topics from a local and a global perspective by studying the results of students attending an elite private institution, Bucknell University, while comparing these outcomes to a number of international trends and

policy makers. Colleges across the country have committed to increasing the diversity of their student body by expanding their accessibility to students from lower socioeconomic groups. This research aims to examine accessibility to Bucknell from Fall 2006 to Fall 2018 while analyzing if trends across these twelve years have impacted students' ability to experience upward mobility upon graduation. In addition, these factors will be compared to international higher education trends of countries that claim to experience the highest levels of mobility among their students.

3. Data

Secondary data used in this study was provided by Opportunity Insights collection of publicly accessible datasets that provide data on social mobility and a variety of other outcomes from life expectancy to patent rates by neighborhood, college, parental income level, and racial background. Three particular datasets were chosen due to their connections to the topic at hand and their abundant information on colleges across the United States. The selected data sets are labeled: Preferred Estimates of Access and Mobility Rates by College, Baseline Cross-Sectional Estimates of Child and Parent Income Distributions by College, and Baseline Longitudinal Estimates of Child and Parent Income Distributions by College and Child's Cohort.

Dataset One reports estimates of parents' and children's income distributions for students attending college between the ages 19 and 22 in the early 2000s. Parental income is measured as the average annual household total income before taxes and transfers and adjusted for inflation to 2015 dollars over five years. The child income category captures individual labor earnings as determined by the sum of wage and self-employment earnings in 2014. Children's percentile ranks are defined by ranking them based on their earnings relative to others in their birth cohort. Meanwhile, parents' percentile ranks are based on their incomes relative to other parents with children in the same birth cohort. Finally, colleges are based on the institution a student attended most frequently during four calendar years between the ages of 19 and 22.

Dataset Two reports the baseline estimates of parents' and children's income distributions by college. College level values are calculated as means of students in the 1980-1982 birth cohorts.

Dataset Three is fairly similar to dataset two, however this dataset includes the variable "cohort" which indexes the child's birth cohort from 1980 to 1991. This collection of datasets

will be useful in organizing colleges into mobility rankings, based on the information provided on their student income, parent income, and mobility indexes provided.

Specialized data used for this study was collected from Bucknell University's Office of Admissions, Registrar, Financial Aid, and Center for Career Advancement to produce data on access, admittance, and matriculation through the institution. To maintain the continuity of the study, the dataset is composed of all domestic Bucknell applicants from Fall 2006 to Fall 2018. The data was originally made available in Fall 2018 through research conducted by Janet Knoedler, Autumn Patterson, and Emily Tevebaugh. All persons who viewed and utilized the data fulfilled Institutional Review Board (IRB) requirements. Data points were traced using Bucknell student identification numbers and matched across individual variables. Once data streams were merged, student ID numbers were replaced with random numbers in order to maintain confidentiality, in accordance with IRB guidelines. Once data has been de-identified it includes the following variables: race, gender, cumulative GPA, student major, college the student applied to (College of Arts and Sciences, College of Engineering, College of Management), college the student graduated from, parental income, financial aid, Pell grant recipient status, first generation college student, and student athlete.

Previous studies were able to further clean and de-identify the data that was used for the remainder of this research (Tevebaugh 2019, Patterson 2019). This was attainable by using the home addresses to geocode each student's geographic region and matched by census tract. As matches were made, the identification number was deleted along with specific addresses to clean the data and preserve the identity of all individuals. The demographic variables were obtained through the American Community Survey (ACS) by the US Census across three separate five-year spans (2006-2010, 2008-2012, and 2012-2016) to align with the data provided from

Bucknell University. The variables include total population of home locale, racial distributions, educational attainment statistics, the unemployment rate, and the GINI Index of Income Inequality.

The original Bucknell dataset contained 102,855 individual observations of unique identification numbers and records. However, only 37,742 of these individuals reported current parental income and therefore would be considered for the intergenerational mobility trends. Furthermore, of that dataset only 18,649 of those individuals were admitted to Bucknell and can be considered for matriculation. After the data were cleaned, the average parental income was $181,529.28 with a standard deviation of $200,391.66. The high standard deviation in income is a product of the extremely high incomes at the upper end of the income distribution. The minimum income reported was presented as a negative number, but this was entered in the data set as 0 for the purposes of this study. Maximum income reported is $6,137,867.00. Of the admitted students, 52.05% are need-based recipients, 10.92% are Pell Grant recipients, and 5.82% are First Generation Students. Furthermore, 76.69% identify as white, 7.65% as Asian, 2.28% as African American, and 7.62% as two or more races. The census tract that indicates Bucknell students' location when not at school has an average Gini coefficient of 0.42, with 68.13% of families owning houses worth over $1 million, and 6.29% of people living below the poverty level. Tables in the appendix provide more descriptive statistics of the variables in the dataset.

The datasets used throughout this study focus on the trends in parental income, student salary, and several student identifying variables in order to ascertain the trends in intergenerational mobility of students after college. As a collection of secondary data, these datasets will be analyzed through statistical models and varying trends in the following chapter.

4. Methodology

The study uses a combination of comparative analysis and descriptive statistics. Part one of the study focused on secondary data calculated by Dr. Raj Chetty and his research team at Opportunity Insights. From the mobility report cards and statistical analyses every University in the United States was ranked on their ability to promote intergenerational mobility or inhibit the opportunity for their students. This provides a detailed understanding of how U.S. colleges and universities have impacted social mobility in recent years. Chetty *et al.* (2017) created a comprehensive analysis of all colleges in the U.S., linking students to their parental household income through tax records. The studies take into consideration colleges' role in intergenerational mobility, based on a number of variables including, but not limited to parental income, subsidized tuition, scholarship grant offers, and racial / ethnic backgrounds.

Using the data and trends from these comprehensive studies, part one of the thesis will demonstrate current national trends in social mobility in relation to higher education which can be used in comparison to the data provided in the following segments on the trends at Bucknell. In addition to the statistical data provided by economists, this study will use the top three performing national colleges, top three performing elite colleges, and top three liberal arts colleges in mobility ranking to determine their policy implications. National colleges take into consideration all institutions across the United States when determining the top performing colleges in social mobility. Meanwhile, elite colleges are due to their low acceptance rates and liberal arts colleges are based on the specific curriculum comparable to Bucknell University. Further analysis of the policy implications of the practices of these institutions is important to help understand the ability of universities to promote social mobility. This will provide a baseline, which is an important first step before part two of the study.

Part two of the thesis uses descriptive statistics to analyze Bucknell University's impact on social mobility based on admissions data and outcomes after college. Data is drawn from the study, "Equality of Opportunity and Outcomes at Bucknell University: An Application of Chetty's analysis of upward mobility and college," originally collected by Dr. Knoedler, Research Librarian Carrie Pirmann, Autumn Patterson, and Emily Tevebaugh. To analyze the intergenerational social mobility of students through Bucknell, trends are separated into defining variables of students. These include: First-Generation Indicator, POSSE Indicator, Pell Grant Indicator, Need Based Indicator, gender, racial identifiers (White, Black, Asian, Hispanic, or other), and additional variables (see Table A). Students will also be separated into income quintiles based on their starting income groups from the current household income thresholds. After grouping the students into income brackets the mobility will be calculated based on their original family income and starting salaries after graduation.

Statistics to help understand the importance of these variables are constructed by determining the average, standard deviation, minimum, and maximum parental income of admitted students. This helps provide an overview of the income brackets that most students fall under across the university. Next, the same process will be used to determine the average, standard deviation, minimum, and maximum parental income of students in the bottom quintile (Q1). As the parents in the bottom quintile have the lowest income levels across the university, they are useful to help further depict future opportunities in mobility. Once again, the data will be applied when determining the mean, standard deviation, minimum and maximum levels of student starting salaries. This is the first step in understanding how Bucknell enables or restricts intergenerational mobility. Note that the data provided for the number of students with starting salaries has fewer observations than the number of observations of overall parental income due

Table A: Bucknell Data Variables

Variable Name	Definition
Year	Year that student was accepted for entry to Bucknell University (from Fall 2006 to Fall 2018)
Parental Income	Parental income reported in dollars on students who applied for financial aid through FAFSA
Student Salary	Student starting salary reported in dollars to Bucknell Center for Career Advancement upon graduation
Need-Based Aid Recipient	Indicator variable equal to 1 if a student received need-based aid from Bucknell University
Pell Grant Recipient	Indicator variable equal to 1 if a student is a Pell Grant recipient (federal award given to students from low-income families)
Community College Scholar	Indicator variable equal to 1 if a student is a Bucknell Community College Scholar (high-achieving, low- to moderate-income community college students attending Bucknell)
POSSE Scholar	Indicator variable equal to 1 if a student is a POSSE Scholar (partnered through the Posse Foundation)
First-Generation Student	Indicator variable equal to 1 if a student is the first in their family to graduate from a four-year college or university
White	Indicator variable equal to 1 if a student is White or Caucasian
Black	Indicator variable equal to 1 if a student is Black or African American
Asian	Indicator variable equal to 1 if a student is Asian
Hispanic or Latino	Indicator variable equal to 1 if a student identifies as Hispanic or Latino
Race Other	Indicator variable equal to 1 if a student identifies as race “other” (including Hawaiian, Pacific Islander, American Indian, and Alaska Native)
Male	Indicator variable equal to 1 if a student identifies as male
Female	Indicator variable equal to 1 if a student identifies as female

to lack of released information due to attendance in graduate school, volunteer programs, or additional extenuating factors.

The student identifying variables will also help provide upward mobility rates as the fraction of students who come from the bottom quintile (Q1) of the income distribution and end up in the top quintile (Q5). This measures socioeconomic mobility and was chosen by Chetty *et al.* (2017) to calculate the mobility rates of national universities. This determines mobility across identifying factors of students to analyze Bucknell as a whole in supporting students. The college's mobility rate is the product of its low-income *access*, the fraction of its students who come from families in the bottom quintile, and its *success rate*, the fraction of such students who reach the top quintile:

P (Child in Q5 and Parent in Q1) = P (Parent in Q1) * P (Child in Q5 with Parent in Q1)

mobility rate = access * success rate

The Parental Income per variable is determined by finding the percentage of students from the bottom parental income quintile that qualify under an identifying factor from Table A. For the purposes of these calculations the bottom quintile was calculated as a family income of up to $67,921 due to the incomes provided in "Equality of Opportunity and Outcomes at Bucknell University: An Application of Chetty's analysis of upward mobility and college." However, because the students only have a starting salary accessible from the data collection, a separate level of income brackets was required for the student salary. For the purposes of this study, students are considered to be in the upper quintile (Q5) with a starting salary of $67,000 or greater based on the division of supplied statistics.

After determining the mobility of all Bucknell students who qualify under different variables, the data will also be used to determine if mobility has adapted as a whole across the

institution across a 6-year time span. The data is only available for student outcomes between Fall 2008 and Spring 2013, so this is the maximum time period this study can examine. The mobility rate will be calculated per year to compare to how admissions rates for lower income students correspond with higher income outcomes across the 8 years. Using the same equation as above, rather than depicting the social mobility per variable, the year of enrollment is used. This helps demonstrate the mobility rate for each independent year at Bucknell and illustrate if mobility has improved over time. The same income brackets and constraints are used in this section of the study: percentages are calculated based on the year's data, not the dataset as a whole. The tracking of these trends can help determine if there has been a dramatic change in a positive or negative direction in socioeconomic mobility. After being calculated the data will be displayed using the data visualization tool, Tableau, for an in-depth look at how the mobility rates can explain Bucknell's ability to promote or prevent student mobility.

The data are also important in helping determine success rates across the different parental income quintile distributions. This determines which students end in the upper quintile based on their starting salaries upon graduation. Success rates are calculated for each quintile and the percentage of student starting salaries are based on available data in each parental income quintile group. This helps determine if students from higher income groups have a greater chance of achieving high starting salaries compared to their peers from low-income families. This will test the theory from Chetty *et al.* (2017) that students from all economic backgrounds have the same chances of succeeding once they attend the same elite college.

The third portion of the thesis compares social mobility fostered by schools in the U.S. with that in select European countries. Secondary data from Denmark, Norway, Finland, and Sweden is based on their rankings as the top global countries based on the Global Social

Mobility Index 2020 from the World Economic Forum. While the United States consistently ranks lower, 27th in the same study, this creates an opportunity to evaluate successful policies of the European nations. Based on social mobility rankings, this portion of the thesis will analyze how higher education policies enable or are ineffective in impacting higher levels of mobility. This analysis is determined by gathering current government policies, institutional regulations, and comparing them to national trends in higher education. The collection of common themes and administrative trends will help further depict a foreign explanation for social change and assist in the development of recommendations for the U.S. context.

The use of these methods will help determine the national rates of social mobility across higher education institutions. Looking at the leading universities that promote economic mobility among their students will help connect to the trends across Bucknell University and the school's ability to help their students have equal opportunities for success. Is there a specific factor that allows or inhibits their low-income students from achieving a high-income salary after graduation? These trends will depict if the school has followed their pledge to promote higher rates of equality among students throughout the years. Results from national institutions and Bucknell University relate to the low social mobility rates of the United States in comparison to other countries around the world. The analysis of the Nordic countries will present a number of variables that allow for equal opportunities among their citizens correlating to their high rates of social mobility. The results from these analyses will be explained in detail in the following chapter.

5. Results

The following chapter will cover the results from the study analyzing National College data, Bucknell student data, and trends in International mobility data. Intergenerational social mobility across the United States is separated into four levels of analyses from the top mobility performers across all national colleges, the top performers across elite colleges, the top performers across liberal arts universities, and how Bucknell compares to the national averages of other institutions. Data from Bucknell University is used for an in-depth analysis of student mobility rates starting with the comparison of how student identifying variables such as race, gender, parental income, scholarship, and status of grant recipients can affect a student's chances and upward mobility. Next, trends in mobility across the University are shown to depict how mobility rates have adjusted between 2008 and 2013, the years both parental income and student starting salaries are available. Parental income distribution is used to determine mobility rates of students demonstrating how the parental income quintile of a student can alter their chances at future mobility upon graduation. After determining a student's chances of achieving mobility, the likelihood they can attend a selective liberal arts institution falls into question. Accessibility to Bucknell University across these variables is then determined through acceptance rates as another factor affecting chances of attaining a higher level of income. These results are then compared to the international trends in mobility from countries in the Nordic Region: Denmark, Norway, Finland, and Sweden. As international leaders in social mobility, this illustrates their ability to consistently help their citizens in efforts to decrease inequality.

5.1 Intergenerational Social Mobility in the United States

Data provided by Dr. Raj Chetty and his research team at Opportunity Insights rank every college across the United States based on their ability to promote access and intergenerational

mobility for their students. The studies cover university, tax, and census data from 1999-2013, characterizing parents' incomes and students' earnings. The results from these studies vary across colleges, leading to substantial variation in upward mobility rates. These differences in mobility rates raise the possibility that increasing low-income access to colleges coupled with good student outcomes could increase higher education's contribution to upward mobility.

Interestingly, low-income students admitted to selective colleges earn income outcomes similar to those of their peers from higher-income families. Nationally, children from the poorest families are substantially less likely than their peers from richer backgrounds to reach the top of the income distribution. But comparing two students at the same college, this difference almost entirely disappears resulting in similar income brackets of these students. This suggests that low-income students are not "mismatched" at these elite institutions and that increasing the number of students on campus from such backgrounds could be a powerful policy to expand opportunity (Chetty *et al.* 2017). This result mitigates the concern that attending a selective institution may be detrimental for students from disadvantaged backgrounds. This promotes policies that emphasize providing students of all backgrounds with equal access to selective colleges. In addition, efforts to expand low-income access often focuses on elite colleges, such as Ivy League universities. These colleges are known to provide students with the background and opportunity for excellent outcomes upon graduation.

The colleges with highest mobility-rates are California State – Los Angeles, the City University of New York, and the University of Texas-El Paso, which all have excellent outcomes while admitting large numbers of low-income students. Since they are not exceptionally selective in S.A.T. scores, it is plausible that they have successful programs designed to specifically promote equal mobility among all students relative to other colleges with similar applicant pools.

Characterized as large, high value-added universities, they can provide a scalable model for increasing upward mobility for large numbers of students. They have mean annual instructional expenditures of about $8,000 per student, far lower than the mean instructional expenditure of $54,000 per student at elite private colleges. Meanwhile, low-income access trends have shown a decline at colleges with the highest mobility rates and slight change at elite private colleges despite their efforts to increase financial aid (Chetty *et al.* 2014).

When looking at the overall mobility index, measuring the extent to which an institution educates more economically disadvantaged students and graduates them into good paying jobs, California State – Los Angeles, the City University of New York, and the University of Texas-El Paso rank higher than their peers, including 2,137 institutions across the United States. Students at the City University of New York have a median family income of $40,200, and only 15% of the student body comes from the top 20 percent. About 12% of students at the college come from low-income families but end in the top quintile income bracket. Mobility level is high because their median parent income is in the bottom 83% of income for parents with children attending colleges, while the median student income at age 34 is in the top 15% at $48,500. California State, Los Angeles students have a median family income of $40,300, and 12% of students come from the top 20 percent. About 10% of students come from low-income families from the bottom quintile but move into the top quintile after graduation. Like the City University of New York, mobility levels are high, with 83% of the families coming from the bottom quintile, whereas the median student income after graduation is in the top 25% at $43,000. The students at the University of Texas – El Paso have a median family income of $33,300, and 11% of the students come from the top 20 percent. About 8% of students come from low-income families, from the bottom quintile, but end in the top quintile income bracket. High mobility of the university is due

to 90% of students coming from a low quintile income family, but median student income is in the top 26% at $42,800 at age 34.

The critical trend across these three universities is their promotion of access in providing low-income students the opportunity to attend a good college. Whether an Ivy League or a mid-tier institution, there is very little difference in their performance with their peers from wealthy backgrounds. California State, Los Angeles offers financial assistance as grants, federal work-study, scholarships, direct federal loans, private loans, California dream loans, nursing loans, and TEACH grants. They also maintain low tuition and fees for students who do not receive financial aid, paying between $15,000 and $25,000 a year. Yet, 94% of students are able to obtain some form of financial aid allowing their student body to increase access to lower-income families while maintaining their ability to provide an excellent education. Regardless of their low tuition level, the majority of students pay far less than the set fees. The City University of New York founded City College of New York as the first tuition-free college in the United States, emphasizing the provision of a high quality and affordable education to generations of New Yorkers. Through the help of need-based federal Pell Grants and New York State Tuition Assistance Program (T.A.P.) awards, more than 100,000, or 58 percent, of students attend the City University of New York tuition-free. The University of Texas-El Paso also started the program PayDirt Promise, which covers tuition and mandatory fees for students whose families make $50,000 per year or less. All three of these universities are mid-tier public institutions with mobility rates, percentage of students moving from the bottom to top quintile income bracket, above 6% along with much lower expenditure and selectivity levels. Low tuition and high geographic coverage of state and public universities allow greater accessibility to students of all backgrounds. The public colleges remain competitive with students' strong success rates by

maintaining a strong emphasis on equal opportunity with the support of local and national government funding. However, there is an appeal for students to attend other elite institutions that can provide stronger resources and a quality private education.

An elite institution refers to around 65 national schools with the most restrictive admissions criteria. Averaging an acceptance rate of 30% or less, these colleges appeal to applicants with an exemplary record to match their selective reputation. When comparing all elite universities across the United States, the University of California Los Angeles (U.C.L.A.), University of Miami, and University of Southern California (U.S.C.) excel as leaders in the overall mobility index. The median family income from U.C.L.A. students are $104,900 and 48% come from the top 20 percent. About 5.6% of students at the university came from low-income families but ended in the top income quintile. Many elite universities have families with high income levels, which is why U.C.L.A. ranks last in median parent income compared to other elite colleges but in the top 15% across all national colleges. The university also ranks in the top 45% of median student income at $65,800 compared to other elite schools. The University of Miami has a median family income of $146,600, and 60% of students come from the top 20 percent. About 3% of students at the university came from low-income families in the bottom quintile but moved into the top quintile. It ranks 48th out of 65 elite colleges in median parent income and 53rd in student income at $54,800. While the ranking of student income is in the bottom 83%, the mobility level remains high because of the likelihood that a low-income student moved into the top quintile. U.S.C.'s median family income is $161,400 and 63% come from the top 20 percent. About 3.9% of students come from low-income families but become high-income individuals. Compared to other elite colleges, high mobility is due to the

university's ranking in the lower 58% of median parent income while median student income is in the top 50% at $63,700 at age 34.

Elite universities have difficulty generating a high level of intergenerational mobility as the majority of their student body is from the top 20 percent. With a lower percentage of the student body coming from the bottom quintile income bracket, their mobility rates are lower in comparison to more accessible universities. While their low-income students tend to match outcomes to their wealthy peers, most of the total population at elite universities remains in the same income bracket resulting in low mobility rates. As a public college, the University of California - Los Angeles has the highest level of mobility across elite institutions due to low tuition compared to private colleges. In addition, they implemented the Blue and Gold Opportunity Plan, which covers all student fees for students with a family income of less than $80,000. As with most other universities, they have numerous forms of financial aid: U.C.L.A. Regents Scholarships, U.C.L.A. Achievement Scholarships, University Student Aid Program Funds, Cal Grants, Middle-Class Scholarship Program, Pell Grants, and Supplemental Educational Opportunity Grants. The University of Miami also promotes its financial aid, which helps 73% of students afford their $73,700 tuition. They emphasize that 100% of demonstrated financial need is met for all students but do not provide specific grants for low-income families beyond standard financial aid. U.S.C. delivers 65% of students some form of financial aid, but the U.S.C. Affordability Initiative provides free tuition to certain families with an annual income of less than $80,000. While these schools maintain high financial aid and grant packages, their overall tuition costs are far greater than mid-tier public colleges. Their student body has a far higher percentage of high-income students resulting in lower mobility chances and fewer accessibility opportunities for low-income students.

In addition to the limited number of poor students attending nationally elite universities, a liberal arts college adds an additional degree of selectivity for prospective students. These schools are known for their smaller enrollment numbers, class sizes, and student to faculty ratios with a broad academic focus across different majors and disciplines. Top performing colleges in mobility are Harvey Mudd College, Barnard College, and Wellesley College. The median family income from students at Harvey Mudd College is $145,400 and 68% come from the top 20 percent. About 2.9% of students at the university came from low-income families but ended in the top income quintile. Similar to other elite institutions, many liberal arts colleges have families with high-income levels, which is why Harvey Mudd students have a median family income in the top 4% of national colleges but only 50th out of 65 elite colleges. The university also ranks in the top 1% of median student income after graduation at $82,400 compared to other national schools or 5th out of all elite colleges. Barnard students have a median family income of $190,100, and 65% of students come from the top 20 percent. About 3.5% of students at the university came from low-income families in the bottom quintile but moved into the top quintile. It ranks 24th out of 65 elite colleges in median parent income and in the top 1% nationally. The college is 49th in student income after graduation across elite colleges at $56,300. Wellesley College's median family income is $141,000 and 59% come from the top 20 percent. About 2.4% of students come from low-income families but become high-income individuals. Compared to other elite and liberal arts colleges, the relatively high mobility ranking is due to the university's status in the lower 80% of median parent income while median student income matches Barnard College at $56,300 at age 34.

As elite institutions, liberal arts colleges are fiercely competitive and often don't rank high in social mobility compared to public universities and colleges. They try to promote a

greater degree of access and future mobility through the promotion of financial aid resources which appeal to lower income students. About 70% of Harvey Mudd students receive financial aid and about 48% receive need-based aid through grants, scholarships, loans, and work-study. They are also partnered with the RaiseMe program to increase outreach to low-income students and to help alert these students to what actions and achievements will make them competitive in the application process. As many students do not have access to the same college preparation courses this is not only a scholarship but a teaching program to help all students understand the available financial resources available for college. Around 51% of students at Barnard College receive need-based financial aid. The school is also partnered with QuestBridge to recruit high-achieving, low-income students and alleviate the financial burdens of college attendance. Nearly 60% of students at Wellesley College receive financial aid along with a number of grant, scholarship, and work study opportunities maintaining a budget of $74,000,000 dedicated exclusively to supporting students. Across all three colleges, 100% of calculated need was met for all admitted students.

Bucknell University ranks 29th out of 64 elite colleges in the overall mobility index and 1866th out of 2,137 total national colleges (bottom 87%). The median family income of Bucknell students is $204,200 and 73% of students come from the top 20 percent. Based on Opportunity Insights data, 1.46% of students at Bucknell come from low-income families from the bottom quintile but become adults earning in the top income bracket (top 20%). Bucknell's median parent income is in the top 1% of all colleges, while the median student income at age 34 is in the top 2% at $71,800. Graph A depicts how Bucknell University ranks in comparison to all national universities when comparing median family income and student income. The university ranks high in comparison to other universities in graduating students that achieve high salaries.

However, they also maintain a high median family income compared to national data which will be analyzed further later in the study. When comparing Bucknell University's mobility rates and median family incomes to all other national universities, the school maintains a high-income level yet low mobility rate. In addition, national trends and data demonstrate that universities with high mobility rates tend to have low median family incomes (see Graph B). These schools admit high numbers of low-income students providing a greater opportunity for them to achieve successful outcomes and greater income equality upon graduation. This finding is confirmed when comparing the percentage of students from Quintile 1 to the percentage of students achieving incomes in Quintile 5 across national universities. Graph C demonstrates that Bucknell University has a low percentage of students from low-income households and a high number of students achieving wealthy salaries compared to their peer institutions.

Bucknell provides 54% of students with need-based financial aid and scholarship programs, including Bauer Scholars Program, Bucknell Community College Scholars Program, Bucknell Community Engagement Scholars Program, POSSE Program, Pell Grant, Supplemental Education Opportunity Grant, Pennsylvania State Grant, and Work-Study Programs. The majority of Bucknell's student body is from the top 20%, resulting in low mobility levels compared to colleges across the country. Public universities offer lower tuition, appealing to students from low-income families, but the total annual cost of $74,700 discourages many families from applying to Bucknell. On average, Bucknell University has a low "discount rate" as they tend to offer less financial aid than most other peer institutions. Even compared to other liberal arts colleges they only meet 92% of students' financial aid needs compared to 100%. Similar to other elite and liberal arts colleges, upon graduation students from low-income families have similar outcomes to their wealthy peers, as explored in the following sections. Still,

the limited number of students from the bottom quintile results in a low mobility rate for the university.

5.2 Bucknell Variable Mobility Rate Results

Using data from all students who were accepted to Bucknell from Fall 2006 to Fall 2018 who filed for financial aid through FAFSA, a formula was developed to understand intergenerational mobility trends. The selected variables such as scholarship and grant recipients demonstrate which student characteristics affect the likelihood of achieving upward mobility in socioeconomic status. The rates of student starting salaries are compared to parental income brackets to help depict change or stagnation in Bucknell's success rates.

As seen in Table B, the parental income statistics for students across Bucknell provide evidence for the correlation between a student's background and financial support. Across all students, the average annual family income was $181,529.28, with a maximum family income of $6,137,867. Across the differing aid and payment indicators, the lowest average family income was for Community College scholars at $29,658.36, while the highest average family income was for need-based financial aid recipients, who had an average family income of $105,716.60. This demonstrates that across the grant and scholarship programs provided by Bucknell, low-income families make only 16% of what average families who applied for financial aid at Bucknell make. Yet, need-based aid is provided to 54% of the student body, implying that the grant and scholarship programs offer a large percentage of the student body aid in addition to low-income students. However, the university's financial aid offerings are consistently lower relative to competitors confirming a low discount rate.

Income quintiles for parental income were calculated based on the distribution of total data points across the dataset. With 18,650 data points providing ample information on students

and their parents' income distribution, each quintile was made of 3,730 individuals. The bottom quintile (Q1) made up 4.11% of the total income of all Bucknell families (who applied for FAFSA), Quintile 2 represented 10.12%, Quintile 3 represented 15.31%, Quintile 4 represented 22.30%, and Quintile 5 represented 48.15%. While the same number of students' data is represented in each of the five groups, almost half the income distribution was present in the upper families of the upper 20 percent (see Table O).

The bottom quintile (Q1) of parental income, seen in Table C, was determined by the data provided in the dataset for consistency across all calculations throughout the study. The average income in this bracket was $37,336.71 with a maximum income of $67,921. Low-income students across Quintile 1 falling into a specific category (Table A) have relatively equal average incomes, indicating that individuals receiving grant money and financial support are found across most students in this income segment. For the purposes of this study, variables were treated independently regardless of if a student fell into multiple categorizations. This fraction of student information is essential in finding the mobility rates moving forward as students starting in this income bracket who move to the highest quintile represent successful upward mobility.

The student starting salary is used as a framework to understand the average income of students upon graduation and hence as a measure of mobility. Based on the salaries reported to the Center for Career Advancement, to be considered in the top quantile, Q5, a student must make $67,000 or more. The average starting salary of all students is $52,186.75, with a minimum income of $1,200 and a maximum of $500,000. Across the student identifying variables, the average starting salary is relatively constant, seen in Table D as running between $46,030.00 and $56,660.37. This matches the information from national college data that elite colleges provide students relatively equal outcomes upon graduation regardless of students' initial family income.

Irrespective of financial aid or grant support, students' salary after graduation across all variables is relatively similar, indicating that Bucknell University provides students with similar opportunities to achieve success. There are larger discrepancies when analyzing the ranges (minimum and maximum) of the students income. However, it can be assumed that the average student across these variables has a similar outcome opportunity when compared to their peers. Therefore, given the success rates of students from all quintiles achieving high incomes at a similar rate, the overall low mobility rates of Bucknell is a product of limited access rather than limited opportunities provided to admitted students.

The mobility rates based on the variable classifications of students, found in Table E, demonstrate how the federal government or Bucknell's financial aid can impact students' intergenerational mobility. Bucknell University has a mobility rate of 2.74% in helping students from the bottom quintile in family income move into the top quintile of student income upon graduation. This is the baseline that other variables compare to when demonstrating which students have a greater chance at upward mobility. Need-based aid recipients (3.98%), Pell Grant recipients (12.76%), Community College Scholars (14.09%), POSSE Scholars (12.28%), and First-Generation students (6.80%) all achieve higher levels of upward mobility compared to the average student from the low-income quintile. These calculations are trying to determine a student’s chances of moving from the bottom quintile of parental income to the top quintile of student starting salary. Community College Scholars have the highest mobility rate as 98% of students are from a low-income background, while around 14% of students reach the highest level of success upon graduation. While the university's overall mobility rate ranks lower than the majority of colleges across the country, the students from low-income backgrounds with the financial aid and support of scholarships and grants have a greater chance of achieving mobility

upwards. Therefore, it is evident that if Bucknell wishes to increase its impact on intergenerational mobility, it must expand the programs that make the most difference, especially the Community College Scholars program and the POSSE scholars program.

The racial background and gender identification of students can also impact students' ability to achieve success through Bucknell. Asian students have the greatest chance of attaining mobility upward with a 7.53% mobility rate, while African American and black students have a rate of only 1.75%. These mobility rates are expressed as a percentage of students identifying as a particular race within the bottom quintile parental income group. Students who racially identify as “other” have a mobility rate of 0 based on the data provided—none of the students who shared their financial data reported achieving a salary above $67,000. Also, there is a higher percentage of women than men with a low-income background, yet males have a higher mobility rate (3.77%) than their female counterparts (1.85%). This suggests that Bucknell provides more significant opportunities for their male students to achieve high success levels upon graduation or implies that there is a salary differential between men and women. 19% of male students from low-income backgrounds achieve success by ending in the top quintile income group while only 9% of women achieve the same.

The formula for mobility rates across the student identifying variables demonstrates a significant relationship between financial aid, grant, and scholarship programs to help students from low-income groups achieve success and upward mobility. However, a student's race can also directly impact a student's chances for success as Hispanic/Latino and Asian students have high rates of mobility. In contrast, African American, white, and “other” students have a lower mobility rate than the average student from Q1. While there may be many explanations for this racial disparity, one could be Bucknell’s reputation for lack of racial diversity. The bottom

quintile has high numbers of Asian, Hispanic/Latino, and “other” students, while only 15% of white students are from low-income households (see Table P). This demonstrates that while Bucknell does admit a limited number of diverse students, a large portion of this population is from the bottom quintile with 42.6% of black students, 29.6% of Asians, 35.1% of Hispanics, and 33.3% of other racially identifying students coming from Quintile 1.

5.3 Bucknell Yearly Mobility Rate Results

Similar to the data calculated across the identifying variables of students from Bucknell, the parental income, a student starting salary, and students' success rates were calculated across available yearly data to determine changes in mobility rates over time. The data for student starting salaries is analyzed for students who applied between 2008 and 2013 due to the lack of significant data reported in other years. These six years help depict trends as Bucknell adjusted their promotion of equal opportunity for all students.

Table F shows the results when analyzing student’s household incomes as reported when they filed for financial aid through FAFSA across the six years. 2008 had an average annual income of $157,508.12, which increased at a relatively stable rate with the highest average in 2013 at $173,150.35. The data represented across the table is from all students, not just those whose parents fall under Q1. This is an adjustment of 9.93% over the six years, or about an average of 1.65% per year. This is a slightly lower rate of inflation than the national income average of 10.41% across the same period of time or 1.74% per year. This would have impacted average parental income from $136,617.42 to $150,836.43 purely based on national inflation rates. As Bucknell parental income increased at a fairly similar rate, it is implied that students are attending the university from a fairly consistent income background across the years. When

thinking about mobility rates adjusting over time, the increase in parental income does not seem to have a strong influence on mobility rates of students' starting salaries.

Student starting salaries across these six years are located in Table G. While parental income showed a steady increase over the years, student income increased from $48,641.47 in 2008 to $58,090.33 2013. This demonstrates an increase in average salaries of 19% over the six years which is significantly higher than the national inflation rate of 10.41%. This may indicate that students have greater opportunities for financial gain across the period of time achieving greater rates of mobility over time. This also indicates that the financial crisis that began in 2007 and the Great Recession of 2008-2010 did not have a long-term negative impact on starting salaries recovery period. The smaller impact on more experienced workers of the recession and the slow-growth period that follows is typical in that more experienced workers are less likely to be laid off and experience a period of stagnant wages.

Rates of mobility calculated from the selected years demonstrate the university's impact on students from low-income backgrounds achieving future success. The student rates measured per year are purely based on students admitted for each specific year and presented in Table H. It is not a cumulative calculation. Adjustments in mobility rates represent how the university has been able to promote intergenerational mobility for their students throughout the years. Bucknell is well known to be an elite private university with most students from wealthy families. Still, they have consistently talked about expanding their student body to be more economically, racially, and geographically diverse. By offering greater financial aid packages and providing students from low-income backgrounds the educational support required to succeed upon graduation, the university has claimed to emphasize equal opportunity among all students.

Students' mobility rate across the six years has increased from 5.26% in 2008 to 20% in 2013. The adjustment in mobility rates across the existing period time generates a positive trend as seen in Graph D. This correlates to a mobility rate increase from 1.16% to 4.11% over the six years. As the number of students in the bottom quintile never deviates, this adjustment in mobility rates can directly correlate to a positive adjustment in the school's ability to promote higher rates of success.

5.4 Bucknell Mobility Rates Across Parental Distribution

The next level of analysis used the parental income quintiles to determine if students from different backgrounds have an equal chance of achieving success. Table I shows the average income of parents in each quintile: $37,336.71 in Q1, $91,844.05 in Q2, $138,997.63 in Q3, $202,420.94 in Q4, and $427,008.41 in Q5 across all years from 2008 to 2013. This is important in further understanding the ability of students to achieve upward mobility.

Similar to the results of student salaries over the six years of available data, student starting salaries remain relatively constant regardless of their parent's annual income. As seen in Table J, student average starting salaries only fluctuate between $50,703.69 and $53,342.28 across all five income brackets. Parents' income may help students have greater access to elite colleges, yet they achieve relatively similar outcomes upon graduation. This is most likely due to Bucknell's support for all students to succeed academically and have opportunities for networking and employment. However, this can also be due to the limited number of low-income students admitted to Bucknell which will be explored more in the next section.

Table K displays the mobility rates of students whose parents are from different income quintiles for all students admitted between 2008 and 2013. As students' average starting salary remains relatively constant across all five groups, the student success rates, the number of

students who reach the top quintile, also remain stable. The rates of students achieving the top income quintile are relatively stable between 2.5-3%, thereby implying that the original income background of a student does not significantly impact students' chances of achieving success. This aligns with the finding from Chetty *et al.* (2014) that students attending private, elite colleges will obtain similar achievement levels regardless of their original income bracket. Once a student attends a prestigious university, they have relatively equal access to similar resources and achieve similar outcomes.

Across the data provided from "Equality of Opportunity and Outcomes at Bucknell University: An Application of Chetty's analysis of upward mobility and college," receiving grants and financial aid from Bucknell are recognized as highly significant indicators of whether a student will achieve upward mobility. A student's background can have a considerable impact on a student's ability to apply to and be admitted to the college. Yet, the mobility statistics indicate that once they are on campus, it seems all students, on average, have a relative equal ability to achieve stable, well-paying employment. Need-based aid, Pell grants, community college scholarships, posse scholarships, and the support provided to first-generation students not only encourage students from diverse backgrounds to attend Bucknell but implies that they can succeed once on campus. These programs also are associated with high mobility rates because while these students achieve success, their parents are often from the bottom income quintile. As student outcomes are similar according to available data, the low mobility rate of Bucknell University must be due to another extenuating factor.

5.5 Accessibility to Bucknell University

One of the common themes found throughout the mobility statistics confirmed a conclusion by Chetty *et al.* (2017) that students from elite institutions have similar chances at

success once they attend the same university regardless of their parental income background. However, this calls into question Bucknell University's consistently low mobility rate as across all identifying variables, students have similar rates of advancement and economic mobility. The low mobility compared to other private and public institutions can be linked primarily to the limited number of low-income students admitted to Bucknell.

Table L explores the average rates of students admitted to Bucknell through the years from 2006 to 2018. While there is a slight fluctuation over the years, the acceptance ratio across all the thirteen years averages around 31.41%. The lowest acceptance rate was 26.5% in 2015 and the highest rate was 35.5% in 2018. The number of applicants across these years ranged between 6,612 in 2010 and 9,463 in 2015. These rates and statistics are important to point out as a school with complete equal opportunity would have a similar acceptance ratio across all variables that help identify students.

Analyzing Bucknell's admittance of students from different racial backgrounds depicts a clear picture that the majority of the student body is white (see Table M). The variable ratio showcases the percentage of students that are accepted compared to the total students who also identify as a particular race that applied to Bucknell. The ratio across the total number of students is the ratio of accepted students under a specific variable compared to the total number of accepted students. The data for this table was used as the sum of total and accepted students across the 13 years of available data. The ratio of white students admitted to Bucknell compared to other races is 80.4% of the admitted class, Black students make up 3.96%, Asian students are 9.25%, Hispanic or Latino students are 6.95%, and other races make up 1.14% of the admitted students. The US Census average data from 2006-2018 calculates the percentage of the national population as 74.0% White, 12.5% Black or African American, 4.9% Asian, 16.6% Hispanic or

Latino, and 5.7% identify as other races. The Census data and Bucknell University do not consider Hispanic and Latino populations as an identifying race but as an ethnicity. This showcases that when separating students based on their race, Bucknell does not admit a diverse student body compared to data from the US Census. The University admits a higher number of White and Asian students than the national average population yet a lower number of Black, Hispanic, and other race students. However, when looking specifically at the variable ratio of students who applied compared to students from the same racial background that were accepted, Asian students have the highest retention rate at 42.19% acceptance while black students only are admitted at a rate of 22.44%. White students are admitted at a rate of 31.63%, Hispanic and Latino students are accepted at a rate of 31.61%, and other races are accepted at a rate of 34.36% when compared to other students from the same racial group. White students have the greatest population of applicants, and therefore the largest percentage of accepted students. This indicates that the University is unable to appeal to large populations of students from other races thereby and that they are unwilling to offer admission to a similar percentage of black students, thereby reinforcing the lack of diversity among Bucknell's student body.

While the data of accepted students cannot be applied directly to the same variables as the mobility calculations, they do maintain a certain degree of financial qualifications. Variables such as Community College Scholars, POSSE Scholars, and First-Generation Students are only disclosed for admitted students and therefore cannot reveal acceptance ratios. However, Pell Grant Recipients, Need Based Aid students, and students from the bottom income quintile have been disclosed for applied and accepted students which are the variables calculated in Table N. The projection of the yearly acceptance trends across these variables demonstrates a relatively stable acceptance rate between 2006 and 2018. Yet these rates are not equal to the average

acceptance rate across the university showcasing that students from low-income backgrounds are accepted at lower rates than their wealthy peers (see Graph E). These rates were compared to the numbers of accepted students per year from Table L when calculating the ratio across total accepted students per year. While the years were separated for each variable, the average total rates present an accurate depiction of the fairly low levels of students accepted from each identifying variable. Across all students from the lowest income quintile, 62.94% of the students who apply receive acceptance letters to Bucknell. However, compared to the entire student body accepted to Bucknell, students from the low-income bracket only make up 11.54% of the total students. As the bottom quintile of parental income, these students should constitute 20% of the student body, yet the data demonstrate the fundamental issue with the low mobility rate from Bucknell. Being unable or unwilling to admit a substantial number of low-income students means the University cannot promote a large portion of the student body to move from the bottom to top income quintile. On average, students who receive need-based aid only account for 30.7% of the accepted students while Pell Grant recipients only comprise 6.97%. While these students are able to promote higher levels of mobility once they attend Bucknell, the limited access and acceptance to the University creates a substantial barrier that needs to be eradicated.

5.6 International Intergenerational Mobility

Data provided by the Organization for Economic Co-operation and Development (OECD) and the Global Social Mobility Index 2020 from the World Economic Forum selects Denmark, Norway, Finland, and Sweden as world leaders in intergenerational mobility. Across the international mobility rankings, Denmark scores 85.2, Norway scores 83.6, Finland scores 83.6, Sweden scores 83.5, while the United States has a score of 70.4 (see Table Q). One significant difference among Nordic countries' higher education systems compared with that of

the U.S., is the free college tuition offered to national citizens. These countries are welfare states and emphasize equal opportunity among all citizens, regardless of their backgrounds, resulting in high national mobility levels.

Denmark is often seen as a model welfare state with low-income inequality levels and high intergenerational income mobility levels. The Danish national government has a substantial role in higher education as public provision and public spending predominates across all levels of education. In addition, there are no tuition fees for domestic higher education students and extensive grants and loans available to support students' living costs. The higher education system follows the Bologna model as Denmark is a comparatively egalitarian society. The Bologna Process was a European reform created with the goal of providing responses to issues such as the public responsibility for higher education and research, higher education governance, the social dimension of higher education and research, and the values and roles of higher education and research in modern, globalized, and increasingly complex societies with the most demanding qualification needs (Zunic and Donev 2016). This has been achievable through changes in curricula, modernization of facilities and the alignment of programs across European universities with emphasis on supporting clinical courses. Compared to independent institutions across the United States, national-level policymaking dominates the higher education system in Denmark. The state owns most university buildings, may dismiss all universities' boards and policies, and provides public funding for the institutions (Landersø and Heckman 2021).

Higher education is also a well-valued system in Norwegian society, with over 48% of 25-34-year-olds holding a tertiary-level qualification, compared to the OECD average of 44%. In 2016, 33% of 30-44-year-olds whose parents did not attain tertiary education had achieved a college degree, compared to an OECD average of 20%. The OECD (2018) stressed the

importance of higher education institutions in Norway using practices that enhance labor market relevance, such as work-based learning and interactive teaching methods. Adult learning is essential to Norway's education system as these programs can support workers with high participation rates (Pinheiro *et al.* 2019). The country also provides language and social studies courses for newly arrived immigrants and financial support to study associations, folk high schools, and distance learning providers.

Finnish higher education has two complementary sectors: universities for general education, universities of applied sciences, and professionally oriented programs. The Finnish system comprises 38 higher education institutions (H.E.I.s), 35 of which are under the national government's administrative branch (Kivinen and Rinne 1996). Finnish H.E.I.s are independent legal entities with extensive autonomy over administrative, educational, and research-related decisions. Finland has no higher education accreditation system, but H.E.I.s are responsible for conducting self-evaluation (OECD 2020).

Meanwhile, Sweden's education system is relatively decentralized, focusing on overall education priorities and funded through agreements with municipalities and independent education providers, which have the primary financial responsibility. Funding in Sweden is mainly public as a significant part of school funding comes from municipal tax revenues allocated under different funding models depending on the municipality (OECD 2020). Tertiary education is free of charge for all students, except those outside the European Union. Sweden stands out among other countries as having the highest graduation rate of doctoral students at 2.4% compared to the international average of 1.7%.

All four of these Nordic countries provide students ample financial opportunity to attend college and they consistently rank higher in their ability to promote economic mobility among

their national citizens compared to the United States. Popular discussions of the benefits of the Scandinavian welfare state often point to its generous support of childcare and education compared to the U.S. as essential contributors to its greater social mobility (Sanders 2013, Partanen 2016). In these four countries, college tuition is free, there is easy access to quality childcare, pregnancy leave is generous, and there is virtually universal free pre-school. The more child-generous Nordic welfare state produces a much more favorable distribution of cognitive skills for disadvantaged children compared to their counterparts in the U.S. A superficial glance at the evidence might suggest that the greater access to skills and schooling explains the greater Nordic social mobility across generations. While the United States consistently emphasizes the need for a higher education degree, these Nordic countries encourage quality education from a young age. Yet, despite stark policy differences, these countries still have some degree of inequality as the influence of family background still controls educational attainment, similar to students in the United States.

Scandinavian countries invest heavily in child development and boost disadvantaged children's test scores compared to their counterparts in the U.S. Yet, in Denmark, substantial skill gaps remain across children with different family backgrounds (Bleses et al., 2016). While these Nordic welfare states mitigate some childhood inequalities, the sorting of families into neighborhoods and schools by parental advantage levels contributes to Danish educational immobility. The more advantaged Danish children attend schools with peers with more favorable test scores (Esping-Andersen *et al.* 2012). This demonstrates a level of inequality similar to the United States, however the numerous national programs and equality-driven incentives encourage citizens to achieve economic mobility. While the U.S. attempts to incentivize higher

educational attainment, the Danish welfare state promotes cognitive skills for its disadvantaged children attempting to make fundamental changes during the adolescent years of children.

5.7 Conclusion

Higher education has the ability to generate economic mobility among students with national universities promoting equal opportunities through financial aid and support. When analyzing the data across universities that obtain high levels of social mobility, they consistently provide students with generous financial support to appeal to lower income students. Even across liberal arts colleges, the institutions that perform better have larger percentages of students receiving financial aid than schools like Bucknell University. When analyzing data from Bucknell University the mobility rates across variables identifying students stay relatively constant, meaning that students have a relatively equal chance of reaching the top income quintile upon graduation. There has been an overall increase in mobility rates from 2008 to 2013. This is due to the number of students moving from the bottom quintile to top quintile upon graduation. Chetty *et al.* (2014) suggests that low-income students that attend elite institutions have an equal opportunity to achieve a successful outcome as their high-income peers. This is confirmed when analyzing the success rates of students across each income quintile who match in relatively similar mobility rates when achieving the top quintile bracket. As students have a relatively equal chance of achieving success, yet the university maintains a low mobility rate, this calls into question the accessibility of low-income students into Bucknell. Evaluating acceptance rates, it becomes clear that while the university maintains an acceptance rate of 31%, the rate of students from the bottom income quintile is only 11.5%. At a very basic level this demonstrates that regardless of a student's ethnic, academic, or geographic background, students

from a low-income background are at a large disadvantage when applying to Bucknell. This small number of low-income students results in a low mobility rate.

Other universities that consistently rank higher than Bucknell in mobility have more generous financial aid programs which help them appeal to low-income students. With greater interest and future acceptance to these universities, they have a stronger likelihood of achieving mobility if they are successful after graduation. Finally, these results are compared to the mobility rates of Nordic countries which are known to have generous education policies to promote equality. While their national policies consistently support their citizens, they do maintain a certain degree of inequality as wealthy families can control where their children go to school and the outcomes they can achieve upon graduation. Yet, the ability for these countries to allow free education, similar to public American universities with high rates of mobility, demonstrates that access and opportunity are the first steps in achieving greater equality.

6. Limitations

This study has several limitations due to the availability of data and the fact that the Bucknell data is from Fall 2006 to Fall 2018. As the data provided by the university represents past students, current policies of Bucknell may have affected the mobility rates of current students. Since the data were collected, Bucknell has altered their admissions policies allowing for optional standardized test scores with hopes of decreasing the impact of socioeconomic status as a leading factor of college admission. More often than not standardized test scores demonstrate a family's ability to pay for additional academic support or tutoring as college preparation has developed into a money-making industry. The move to standardized testing, "supports the University's mission to provide greater access to students from varying educational and socioeconomic backgrounds, contributing to its participation in the American Talent Initiative — an alliance of colleges and universities dedicated to substantially expanding opportunity and access for low- and moderate-income students" (Ferlazzo 2019). The test-optional policy will be conducted over a five-year pilot to assess the patterns of success for test score submitters and non-submitters. Future research should compile data from recent years, especially due to major institutional changes during COVID-19.

The Bucknell dataset only contained parental income from students who filed for financial aid through the FAFSA, creating another limitation in the amount of data available. A less restricted model would analyze financial information from all students' families, not just the information provided from FAFSA. This creates a bias for students as the wealthiest students don't require financial support and therefore don't always complete FAFSA. While uncommon, students from low-income backgrounds do not always understand the importance of applying for financial aid which can also inhibit their ability to provide FAFSA with correct information. This

creates a bias in the results for students from middle income families or skewed to lower income families. With true holistic analysis of all students the ratio of accepted students from low-income families may be far smaller than existing data suggests. Mobility and acceptance rates from the university could be even lower than current results suggest. In addition, the student starting salaries are only available for students admitted between Fall 2008 and Fall 2013 which further inhibits the ability to identify lasting trends about mobility. This is because the data from students who graduated in Spring 2018 was not available with regard to their post-graduate plans.

As the Bucknell data only provides information on students who applied to Bucknell University, it is not an accurate representation of all college applicants across the United States. This study was only conducted with data from twelve years from one institution, so the findings may not directly represent private elite colleges or liberal arts universities. If the necessary data could be collected and obtained, a less limited study would be able to compare data to all domestic college applicants in the United States. For the purposes of this study, national mobility data from Chetty *et al.* (2014) and Opportunity Insights was used in comparison to the Bucknell University study. This was a limited comparison because the precise scope of data was not identical across the datasets. Future research should be conducted using similar data from multiple schools of similar size and status to determine if they result in similar trends over time, allowing for more general conclusions about colleges across the United States.

Student starting salaries were used to calculate mobility rates as the only variable available to suggest success of students after college. This does not take into consideration other paths students may take upon graduation such as volunteer work or graduate school. The starting salary doesn't completely depict success after college as the majority of studies in mobility

require salary from age 35. If the study could take place across at least a 20-year minimum this level of analysis would be able to depict student outcomes later in life. However, given the limitations of the data and for the purposes of the study, mobility was calculated as student outcomes directly out of college relative to family income.

Accessibility to Bucknell is characterized through a generalized acceptance rate. This is not the most precise analysis of accessibility as each variable is independently calculated. An opportunity to define a specific variable-based accessibility rate would indicate a student's chances at attending Bucknell acknowledging all identifying variables. For the purposes of this study, the mobility rates of students were the main area of focus with accessibility rate generalized to help depict the causation of trends in mobility.

In addition, international data were not publicly accessible and therefore the international comparisons in the study were based on peer-reviewed articles and research provided by governments and non-governmental organizations. Future research could utilize the mobility rates generated on an institutional level to include national and international schools. These studies are important in helping policymakers at the institutional, local, national, and even international levels understand the importance in providing students the financial support to attend college.

7. Conclusion

This thesis examined the intergenerational mobility of Bucknell University students for students admitted to the school between Fall 2006 and Fall 2018. The focus of this study was to generate a comparative analysis of national trends and Bucknell data in establishing how Bucknell compares with other universities across the United States. International higher education policies and outcomes of Nordic countries were also used with hopes of determining a set of policies that could contribute positively toward intergenerational mobility. As an elite liberal arts college, Bucknell ranks low in social mobility compared to other universities across the United States. Yet, the University has committed to expanding access to all students, regardless of the economic, racial, or geographic background. The study analyzed how Bucknell students achieve only a certain degree of social mobility over the years due to low acceptance rates but are assisted with the support of financial aid and grant packages.

This study undertook an analysis of the public and private colleges in the United States that are most successful in achieving intergenerational mobility and identified how particular institutions are able to support the success of students from low-income households. The main factors allowing these colleges to achieve the country's highest mobility rates were increased access to the schools via the generous support of financial aid programs. Appealing to low-income students requires supporting their ability to attend University, which is why many low-income students choose to go to state schools that offer lower tuition and higher financial aid packages. Many state schools are even offering to pay the full tuition of students who fall under a family income of around $70,000 or less. This promotes the idea that these universities are generating greater equity among their student body by appealing to a diverse group of students from all backgrounds. While the federal, state, and local governments may offer grant packages

for students, it is the Universities that go one step further, providing their own additional forms of financial aid that appeals to families from the lowest socioeconomic status groups.

Meanwhile, Bucknell University has attempted to increase their aid packages to students, but the fact remains that the vast majority of Bucknell's student population is from households in the top 20 percent bracket of the national family income. Based on the national data, Chetty (2014) concluded that whether a student attends an Ivy League or a mid-tier institution, there is a limited difference in the student's performance compared with their peers from wealthier backgrounds. In other words, once a student from the bottom quintile gets a degree from a decent college, they have the ability to match their wealthy peers in successful outcomes upon graduation, gaining access to the highest income group upon graduation at the same rate as students from all other quintiles. These data are borne out by this study's analysis of Bucknell data.

As the study analyzed specific data from Bucknell students with regard to their ability to achieve upwards mobility, defined as moving from the bottom quintile in family income to the top quintile in post-graduate income, there were a few indicators that consistently determined a student's chances at achieving a high mobility rate. The background of a student and the year the student attended Bucknell had a large influence on their ability to move up to the top income bracket. Across all background identifying variables, the Community College Scholars have the highest percentage of students from a Q1 background and the highest mobility rate. Students also have high mobility rates, compared to the overall average of the University, when they are considered: need-based aid recipients, Pell grant recipients, community college scholars, POSSE scholars, or first-generation students. All of these programs were created to help students from disadvantaged backgrounds gain the financial and educational support they need to attend

Bucknell University. More than half of the POSSE Scholars and First-Generation students are from low-income families, and they are able to achieve high mobility rates. Almost all Pell Grant recipients and community college scholars are from low-income backgrounds with 96.37% of Pell Grant recipients and 98.63% of community college scholars at Bucknell coming from the bottom income quintile. Yet, these students are able to achieve high rates of mobility with 12.76% of Pell Grant students and 14.09% of community college scholars achieving high rates of success. This demonstrates that Bucknell's financial aid and grant programs can help students from disadvantaged backgrounds achieve successful outcomes when they receive proper care and guidance from the University.

The yearly statistics of mobility rates were important in demonstrating that the success and mobility rates have increased over time. While the calculations for parental income demonstrate a substantial increase in the annual household revenue, the average student starting salaries remain relatively constant between $48,6421.47 and $58,090.33 between 2008 and 2013, possibly indicating the negative impact of the Great Recession on the starting salaries of Bucknell graduates during the period being observed. While the average parental income increased over the observed period of time, there was not a similar impact on the starting salaries of students. Yet, as the number of students from Q1 doesn't change over the years, the adjustment that creates these positive modifications in mobility rate is the actual increase in the percentage of students earning a high salary. From 4.54% of students moving from Q1 to Q5 in 2008 to 20% of low-income students obtaining a successful outcome in the top quintile in 2013, the number of students achieving success drastically increased over the 6-year time span. This correlates to an increase in the rate of students achieving upwards mobility after graduating from Bucknell University. However, this is not a perfect depiction of current trends in mobility due to

the lack of data available for students from extremely high-income backgrounds. These students often do not apply for financial aid and therefore would skew the number of students in the bottom quintile along with the ratio of students able to achieve high income outcomes compared to their peers. Yet, for the existing data, the increase in average student salaries over the years, above rates of inflation, along with the rising rates of success and mobility demonstrates the ability for Bucknell to encourage upwards mobility among students.

However, when directly compared to the mobility rates of other national universities, Bucknell ranks low in achieving a high rate of total students moving from the bottom quintile to the top. While Bucknell is trying to help improve students' chances for economic achievement upon graduation, career guidance, financial support, and countless other factors don't directly help the number of low-income students that have access to attend the University. The mobility rates of students were also calculated across each income quintile to help investigate the assumption that all Bucknell students have an equal opportunity at success once they are on campus. This was proven true as regardless of the student's socioeconomic background, all students who applied for financial aid had similar levels of achieving success by reaching the top income quintile. While certain support systems and aids may allow students from lower household incomes to attend University, everyone who applied for financial aid has an equal chance at success once they are at Bucknell.

The low social mobility rates of Bucknell students are not due to the success rates and individual mobility of students once they attend the University. However, mobility rates are determined by access to the institution. The low rates of mobility are actually due to the overall lack of access that low-income students have to Bucknell. Across all students accepted, on average, only 11% of the students are from the bottom quintile, only 7% are Pell Grant

recipients, and 31% are Need-Based Aid recipients. The limited access for students from disadvantaged economic backgrounds results in low rates of mobility for the University as a whole. Creating more opportunities for students from low-income households to apply to and attend Bucknell is the first step in achieving greater equality and higher rates of social mobility. Once students attend elite institutions such as Bucknell, they have the ability to attain high levels of economic success, but they need a foot in the door before they can achieve these goals.

The comprehensive literature review and policy study of Nordic countries were useful in understanding the national implications of intergenerational mobility. As Denmark, Sweden, Finland, and Norway are the world leaders in upward mobility, it was important to understand how they achieve these high levels of success when thinking about future education and government policy ramifications. These countries promote greater financial access to attend University through free tuition programs, which gives them high degrees of mobility. However, they still have a degree of unequal opportunity through selective testing and admissions processes. These states promote improving the cognitive and life skills of all citizens through standard and vocational education and training. High-salary employment opportunities do not always require high degree achievement like in the United States, but rather learning the proper skills through alternative educational institutions can facilitate the obtainment of high-paid employment. The U.S. can learn from global social mobility trends through the promotion of free college tuition, accessible quality childcare, generous pregnancy leave, and universal free pre-school.

Bucknell can learn directly from existing practices in social equality to provide more financial aid programs to students for greater equity and mobility rates. The University can also review these countries' emphasis on teaching students cognitive life skills when trying to

improve accessibility and opportunities for all students. The United States education system focuses on strict academic majors and disciplines, leaving many students clueless upon graduation about the workforce or life outside the scope of an educational institution. Taking a gap year, participating in a co-op/internship program, or learning job-related skills is what sets the schools and universities in Nordic countries apart from the regimented curricula of institutions in the United States. However, the ability to increase access to all levels of education from primary to tertiary institutions is the key to promoting greater social mobility and equality among all citizens. While Nordic countries maintain a certain degree of inequality, like all countries around the world, their political focus and financial support for equal access have proven to increase the number of students who attend University and achieve economic success.

The background characteristics and variables of students have a great effect on their ability to achieve social mobility upon graduation from Bucknell University. While certain groups of students are able to receive the support needed to attend, matriculate, and graduate from Bucknell, there is always room for improvement when diversifying the student body. While progress has been made over the years of data provided, the University should not stop in its work to achieve greater socioeconomic variety. The primary focus for policymakers and university administrators should be how to increase access to students from the bottom quintile and diverse students. Leading universities in social mobility are able to increase accessibility to low-income students through numerous forms of financial aid. By increasing a student's chances of affording college, they have a strong likelihood of achieving success after college, thereby increasing the mobility rates of universities.

As proven throughout the study, elite institutions have an important potential to help low-income students achieve upward mobility. If colleges, like Bucknell, focus on increasing these

student's access to higher education through greater financial support, they can generate higher mobility rates and more opportunity rather than reinforcing the existing inequalities and privilege. Many public institutions are able to offer a large portion of low-income students free tuition and expenses, generating a larger population of low-income students and resulting in an economically diverse student body. Learning from these universities, along with the leading liberal arts colleges that provide 100% of need-based aid to over half their student body, can help direct Bucknell to make some active changes to their financial aid policies. Removing the application fee and increasing the availability of financial grant and aid programs will help appeal to low-income students, along with support from the University to improve the financial education and offerings for these students. Expanding programs such as POSSE and Community College Scholarships can have an extremely positive impact due to the high success and mobility rates of these students who often come from extremely low-income backgrounds. The Office of Admissions should provide prospective students equal opportunities and information by expanding their current assortment of colleges they visit. Many low-income neighborhoods are not visited by elite institutions and therefore these students do not have the comprehensive knowledge of the value in attending an elite university such as Bucknell. In addition, while increasing tuition may not be a popular policy among parents and families, the high number of wealthy families at the university can help the university create more grants and programs to fund financial aid programs. Developing a progressive tuition program that uses the increased revenue from full-paying students to discount need-based student tuition. This has never been done before but would use the lessons from Nordic countries and successful mobility promoting universities to help low-income students afford college. Finally, mentorship programs are popular among other liberal arts colleges such as RaiseMe and QuestBridge which help recruit

more high-achieving, low-income students and mentor them to help become more competitive in the application process. As Bucknell University has many low-income neighborhoods in the surrounding geographic location of central Pennsylvania, they can take advantage of current financial resources to provide less fortunate families and students the opportunities to achieve success. These can be the first steps into promoting a more equal and opportune future for all students thereby learning from current data and weakening the current cycle of socioeconomic inequality.

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II. Appendix

Table A: Bucknell Data Variables

Variable Name	Definition
Year	Year that student was accepted for entry to Bucknell University (from Fall 2006 to Fall 2018)
Parental Income	Parental income reported in dollars on students who applied for financial aid through FAFSA
Student Salary	Student starting salary reported in dollars to Bucknell Center for Career Advancement upon graduation
Need-Based Aid Recipient	Indicator variable equal to 1 if a student received need-based aid from Bucknell University
Pell Grant Recipient	Indicator variable equal to 1 if a student is a Pell Grant recipient (federal award given to students from low-income families)
Community College Scholar	Indicator variable equal to 1 if a student is a Bucknell Community College Scholar (high-achieving, low- to moderate-income community college students attending Bucknell)
POSSE Scholar	Indicator variable equal to 1 if a student is a POSSE Scholar (partnered through the Posse Foundation)
First-Generation Student	Indicator variable equal to 1 if a student is the first in their family to graduate from a four-year college or university
White	Indicator variable equal to 1 if a student is White or Caucasian
Black	Indicator variable equal to 1 if a student is Black or African American
Asian	Indicator variable equal to 1 if a student is Asian
Hispanic or Latino	Indicator variable equal to 1 if a student identifies as Hispanic or Latino
Race Other	Indicator variable equal to 1 if a student identifies as race “other” (including Hawaiian, Pacific Islander, American Indian, and Alaska Native)
Male	Indicator variable equal to 1 if a student identifies as male
Female	Indicator variable equal to 1 if a student identifies as female

Table B: Parental Income at Bucknell, Variable Statistics (All Admitted Students)

Variable	Mean	Standard Deviation	Minimum	Maximum
All Students	181529.28	200391.66	0	6137867
Need Based Aid Recipient	105716.60	67738.64	0	675870
Pell Grant Recipient	31903.56	19150.38	0	139490
Community College Scholar	29658.36	17007.69	0	72120
POSSE Scholar	79355.80	69136.48	0	561385
First-Generation Student	74351.71	85810.43	0	2012014
White	194095.98	209059.06	0	6137867
Black	143275.88	115230.77	0	1443472
Asian	139511.89	171315.48	0	3600000
Hispanic or Latino	150728.02	168321.24	0	2600000
Race Other	137378.54	136873.94	0	999999
Male	182755.93	217042.10	0	6137867
Female	180429.03	184185.07	0	4900000

Data represented in dollars (Knoedler *et al.* 2018).

Table C: Bucknell Parental Income Variable Statistics, Bottom Quintile - Q1

Variable (Q1)	Mean	Standard Deviation	Minimum	Maximum
Quintile 1 Income Bracket	37336.71	19689.35	0	67921
Need Based Aid Recipient	37967.29	19174.17	0	67921
Pell Grant Recipient	30158.79	17027.14	0	67851
Community College Scholar	29060.31	16348.51	0	67729
POSSE Scholar	35628.05	17102.52	0	67852
First-Generation Student	36432.49	18077.54	0	67869
White	38778.19	20223.12	0	67921
Black	49802.13	18034.01	0	67721
Asian	35648.65	18310.54	0	67851
Hispanic or Latino	35574.50	18630.96	0	67692
Race Other	35042.01	19458.46	0	67828
Male	37566.68	19680.53	0	67921
Female	37132.04	19699.93	0	67854

Data represented in dollars from admitted students.

Table D: Student Starting Salary Variable Statistics (Reported Data)

Variable	Mean	Standard Deviation	Minimum	Maximum
All Students	52186.75	20273.20	1200	500000
Need Based Aid Recipient	51588.93	17689.68	1200	225000
Pell Grant Recipient	51439.24	34327.14	9000	500000
Community College Scholar	51242.86	18292.43	28200	80000
POSSE Scholar	49314.98	17557.58	12500	99999
First-Generation Student	51231.97	16841.03	1200	103000
White	52023.27	16760.67	1200	225000
Black	56660.37	54703.64	12500	500000
Asian	55647.35	18585.04	20800	103000
Hispanic or Latino	48556.18	15477.70	9000	82500
Race Other	46030.00	12597.94	25000	62920
Male	56577.88	23389.60	5000	500000
Female	48063.58	15767.30	1200	103000

Data represented in dollars from admitted students.

Table E: Mobility Rates (Variable)

Variable	Parent Income (Q1)	Student Salary (Q5) (Success Rate)	Mobility Rate
All Students	0.2	0.136986301	0.02739726
Need Based Aid Recipient	0.312351911	0.127516779	0.039830109
Pell Grant Recipient	0.963672067	0.132420091	0.127609543
Community College Scholar	0.98630137	0.142857143	0.140900196
POSSE Scholar	0.549815498	0.222222222	0.122181222
First-Generation Student	0.581952118	0.116788321	0.067965211
White	0.154185022	0.125984252	0.019424885
Black	0.192941176	0.090909091	0.017540107
Asian	0.344078486	0.21875	0.075267169
Hispanic or Latino	0.350690088	0.105263158	0.036914746
Race Other	0.317241379	0	0
Male	0.199138127	0.189349112	0.037706628
Female	0.200569569	0.092307692	0.018514114

Data represented as rates from admitted students.

*Parent Income Calculations are based on the percentage of students through a selected variable with parents in the Q1

**Student Salary Calculations are based on the percentage of students through a selected variable, with parental income in Q1, and with starting salaries in Q5

Table F: Parental Income Yearly Statistics

Year	Parent Income Mean	Standard Deviation	Minimum	Maximum
2008	157508.12	137858.57	0	1191000
2009	160312.63	142810.04	0	1694577
2010	147103.83	119829.33	0	999999
2011	156157.49	127928.35	0	999999
2012	177650.47	174398.28	0	3000000
2013	173150.35	161996.60	0	1877331

Data represented in dollars from admitted students.

Table G: Student Starting Salary Yearly Statistics

Year	Salary Mean	Standard Deviation	Minimum	Maximum
2008	48641.47	19762.87	1200	225000
2009	48840.17	15717.64	12000	100000
2010	51595.42	16582.81	11000	100000
2011	51097.23	17183.32	9600	95000
2012	54393.56	15302.12	18000	115000
2013	58090.33	31686.44	15000	500000

Data represented in dollars from graduated students accepted in the stated year.

Table H: Mobility Rates (Yearly)

Year	Ratio of Students from Parent Income (Q1)	Student Salary (Q5) Success Rate	Mobility Rate
2008	0.219920319	0.052631579	0.011575
2009	0.208333333	0.134615385	0.028045
2010	0.228182546	0.12	0.027382
2011	0.213365539	0.09375	0.020003
2012	0.208366219	0.254545455	0.053039
2013	0.205499276	0.2	0.0411

Data represented as rates from admitted students.

Table I: Parental Income Quintile Distribution Statistics

Quintile	Mean	Standard Deviation	Minimum	Maximum
Q1	37336.71	19689.35	0	67921
Q2	91844.05	13531.70	67968	114911
Q3	138997.63	14608.62	114919	165505
Q4	202420.94	23835.31	165539	250121
Q5	437008.41	321082.53	250123	6137867

Data represented in dollars from admitted students.

Table J: Student Starting Salary Statistics (Based on Parental Income Quintile)

Quintile	Mean	Standard Deviation	Minimum	Maximum
Q1	50703.69	29484.47	1200	500000
Q2	52709.76	15703.44	7200	100000
Q3	52039.01	18652.49	3000	225000
Q4	53342.28	16371.22	10000	115000
Q5	52544.71	14699.90	9600	102000

Data represented in dollars from admitted students.

*Starting salaries of students based on the quintile distribution of their parent's income.

Table K: Success Rates Across Parent Income Quintiles

Parent Income Quintile	Student Salary (Q5) Success Rate	Mobility Rate
Q1	0.137362637	0.027472527
Q2	0.132743363	0.026548673
Q3	0.146031746	0.029206349
Q4	0.180811808	0.036162362
Q5	0.126865672	0.025373134

Data represented as rates from admitted students.

*Quintile represents parent income brackets. Assumption that Parent Income rate for calculations is 0.20

Table L: Percentage of Admitted Students (Yearly Rates)

Variable	Total Number	Accepted Students	Acceptance Ratio
All Students	102839	32300	0.31408318
All Students 2006	8514	2906	0.341320179
All Students 2007	8481	2581	0.30432732
All Students 2008	7481	2273	0.303836386
All Students 2009	6988	2147	0.307240985
All Students 2010	6612	2152	0.325468845
All Students 2011	7200	2078	0.288611111
All Students 2012	7386	2095	0.283644733
All Students 2013	7016	2213	0.315421893
All Students 2014	6934	2297	0.331266224
All Students 2015	9463	2509	0.265137906
All Students 2016	8873	2866	0.323002367
All Students 2017	9058	3044	0.336056525
All Students 2018	8833	3139	0.355371901

***** Data from all students who applied to Bucknell.

Table M: Percentage of Admitted Students (Racial Variables)

Variable	Total Students	Accepted Students	Variable Ratio	Ratio Across Total Students
White	82093	25963	0.316263262	0.80380805
Black	5694	1278	0.224446786	0.039566563
Asian	7084	2989	0.421936759	0.0925387
Hispanic or Latino	7105	2246	0.316115412	0.069535604
Race Other	1068	367	0.343632959	0.011362229
Male	52330	15411	0.294496465	0.477120743
Female	50525	16878	0.334052449	0.5225387

***** Data from all students who applied to Bucknell.

Table N: Percentage of Admitted Students (Variable Statistics)

Variable	Total Students	Accepted Students	Variable Ratio	Ratio Across Total Students
Parents Q1 Total	5925	3729	0.629367089	0.115448916
Parents Q1 2006	741	373	0.503373819	0.128355127
Parents Q1 2007	729	294	0.403292181	0.113909337
Parents Q1 2008	501	277	0.552894212	0.121865376
Parents Q1 2009	430	266	0.618604651	0.123893805
Parents Q1 2010	543	286	0.526703499	0.132899628
Parents Q1 2011	553	266	0.481012658	0.1280077
Parents Q1 2012	446	265	0.594170404	0.126491647
Parents Q1 2013	426	286	0.671361502	0.129236331
Parents Q1 2014	463	298	0.64362851	0.129734436
Parents Q1 2015	521	307	0.58925144	0.122359506
Parents Q1 2016	1337	227	0.169783096	0.079204466
Parents Q1 2017	1336	311	0.232784431	0.1021682
Parents Q1 2018	1286	289	0.224727838	0.092067537
Need Based Aid Total	17237	9917	0.575332134	0.307027864
Need Based Aid 2006	1049	884	0.84270734	0.304198211
Need Based Aid 2007	1211	936	0.772914946	0.362650136
Need Based Aid 2008	1317	726	0.551252847	0.319401672
Need Based Aid 2009	1109	710	0.640216411	0.330693992
Need Based Aid 2010	1367	745	0.544989027	0.346189591
Need Based Aid 2011	1529	762	0.498364944	0.366698749

Need Based Aid 2012	1265	743	0.587351779	0.354653938
Need Based Aid 2013	1126	709	0.629662522	0.320379575
Need Based Aid 2014	1316	756	0.574468085	0.329124946
Need Based Aid 2015	1303	730	0.560245587	0.290952571
Need Based Aid 2016	1580	507	0.320886076	0.176901605
Need Based Aid 2017	1542	850	0.551232166	0.279237845
Need Based Aid 2018	1535	870	0.566775244	0.277158331
Pell Grant Total	4108	2252	0.548198637	0.069721362
Pell Grant 2006	488	159	0.325819672	0.054714384
Pell Grant 2007	543	151	0.278084715	0.058504456
Pell Grant 2008	211	122	0.578199052	0.053673559
Pell Grant 2009	182	141	0.774725275	0.065673032
Pell Grant 2010	247	180	0.728744939	0.083643123
Pell Grant 2011	250	158	0.632	0.076034649
Pell Grant 2012	254	175	0.688976378	0.08353222
Pell Grant 2013	252	188	0.746031746	0.084952553
Pell Grant 2014	273	211	0.772893773	0.091858946
Pell Grant 2015	300	228	0.76	0.090872858
Pell Grant 2016	380	144	0.378947368	0.050244243
Pell Grant 2017	371	232	0.625336927	0.076215506
Pell Grant 2018	360	175	0.486111111	0.055750239

* Data from all students who applied to Bucknell.

Table O: Admitted Student Parental Income Distribution (Across Quintiles)

	Income Sum	Percentage of Total Income
Quintile 1	$ 139,228,594	4.11%
Quintile 2	$ 342,578,314	10.12%
Quintile 3	$ 518,461,175	15.31%
Quintile 4	$ 755,030,116	22.30%
Quintile 5	$ 1,630,041,371	48.15%
All Families	$ 3,385,339,570	

Table P: Racial Distribution of Admitted Students in Q1

Variable	Total Students	Students in Q1	Ratio
White	14302	2206	0.154244162
Black	1068	455	0.426029963
Asian	1987	589	0.296426774
Hispanic or Latino	1594	560	0.35131744
Race Other	261	87	0.333333333

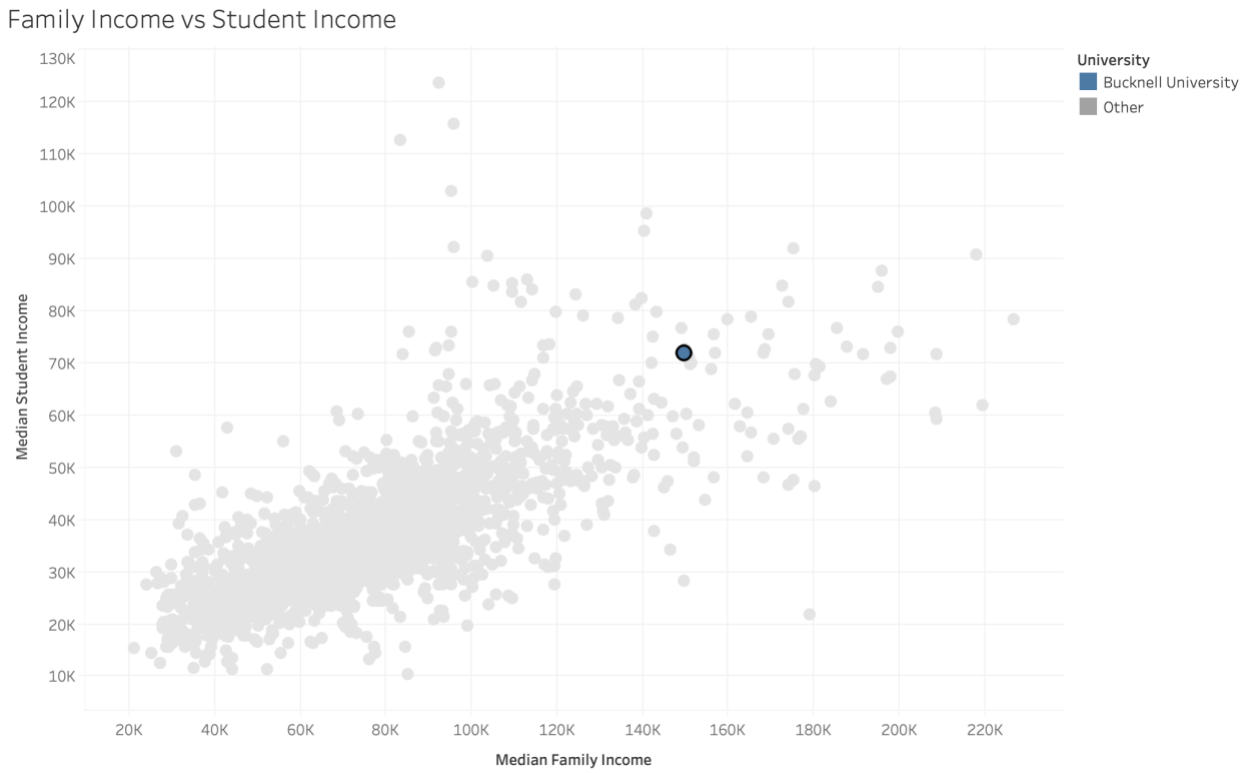
Table Q: Global Social Mobility Index 2020 Rankings (Top 30 Countries)

Rank	Country	Score
1	Denmark	85.2
2	Norway	83.6
3	Finland	83.6
4	Sweden	83.5
5	Iceland	82.7
6	Netherlands	82.4
7	Switzerland	82.1
8	Belgium	80.1
9	Austria	80.1
10	Luxembourg	79.8
11	Germany	78.8
12	France	76.7
13	Slovenia	76.4
14	Canada	76.1
15	Japan	76.1
16	Australia	75.1
17	Malta	75.0
18	Ireland	75.0
19	Czech Republic	74.7
20	Singapore	74.6
21	United Kingdom	74.4
22	New Zealand	74.3
23	Estonia	73.5

24	Portugal	72.0
25	Korea Rep.	71.4
26	Lithuania	70.5
27	United States	70.4
28	Spain	70.0
29	Cyprus	69.4
30	Poland	69.1

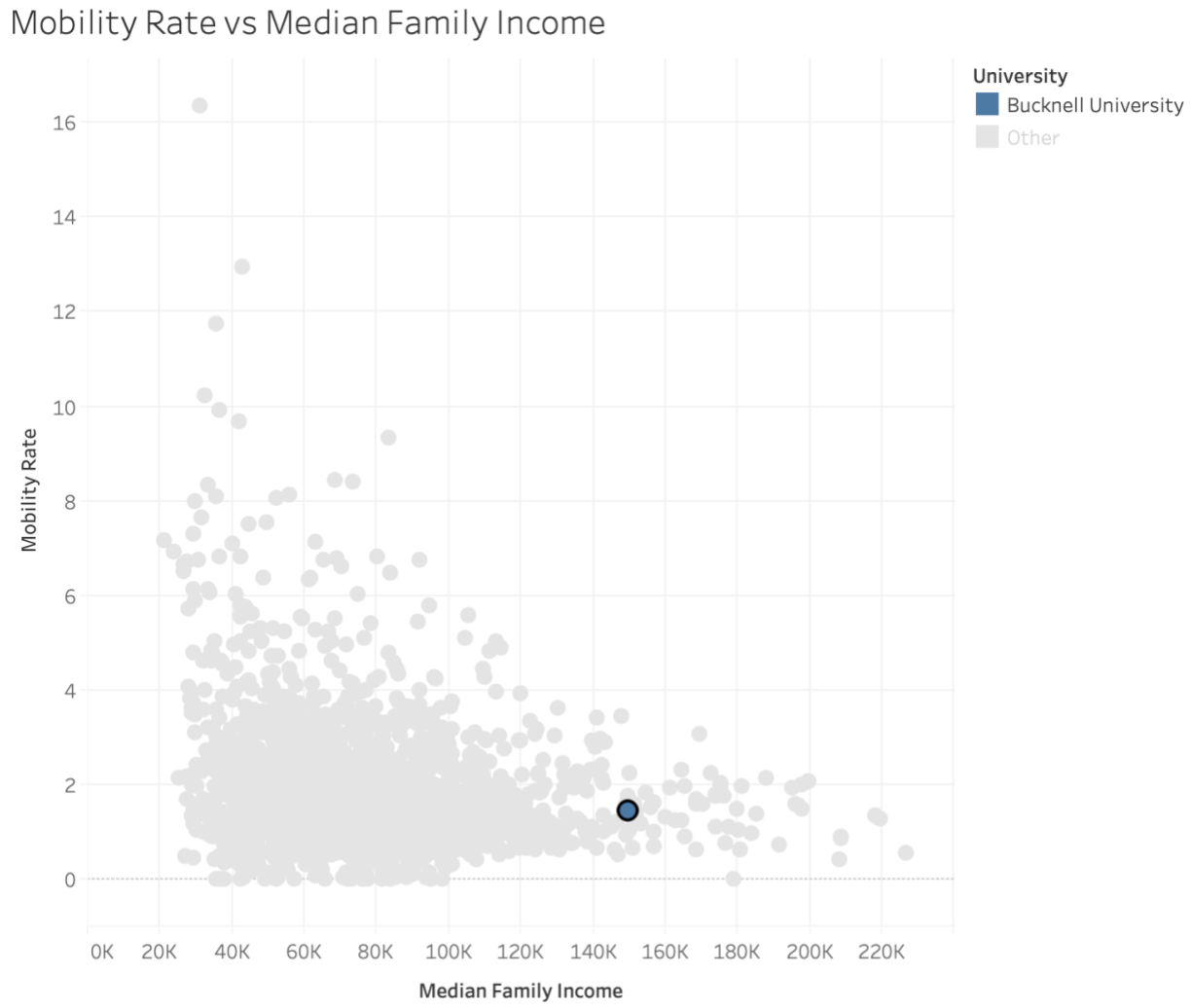
*Provided by the World Economic Forum as a holistic assessment of 82 global economies according to their performance on five key dimensions of social mobility: 1. Health; 2. Education (access, quality and equity, lifelong learning); 3. Technology; 4. Work (opportunities, wages, conditions); 5. Protection and Institutions (social protection and inclusive institutions).

Graph A: Family Income vs Student Income Across National Universities



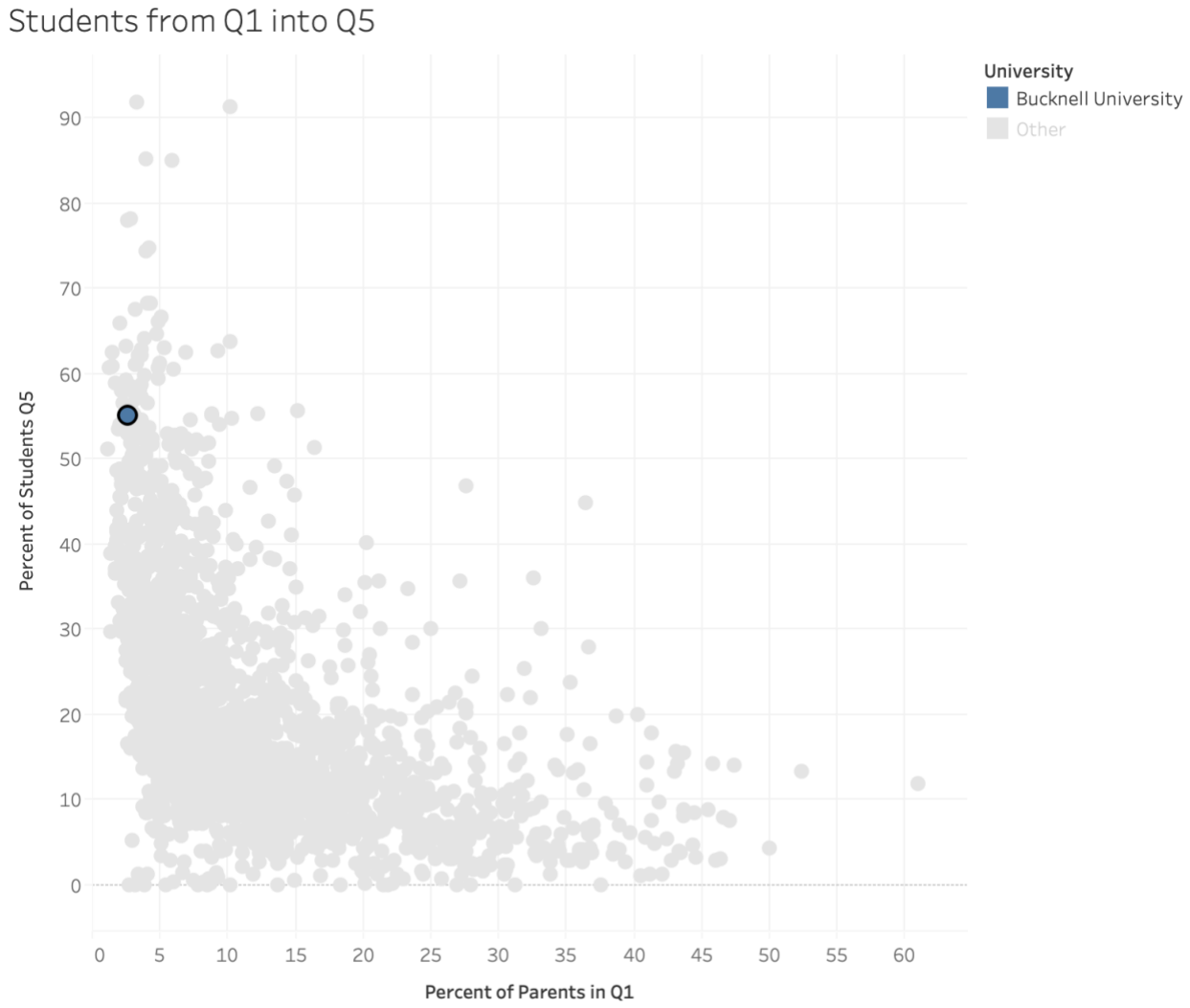
Median Family Income vs. Median Student Income. Color shows details about Median Student Income & Median Family Income 1 (group). The data is filtered on Name, which has multiple members selected.

Graph B: Mobility Rates Across National Universities



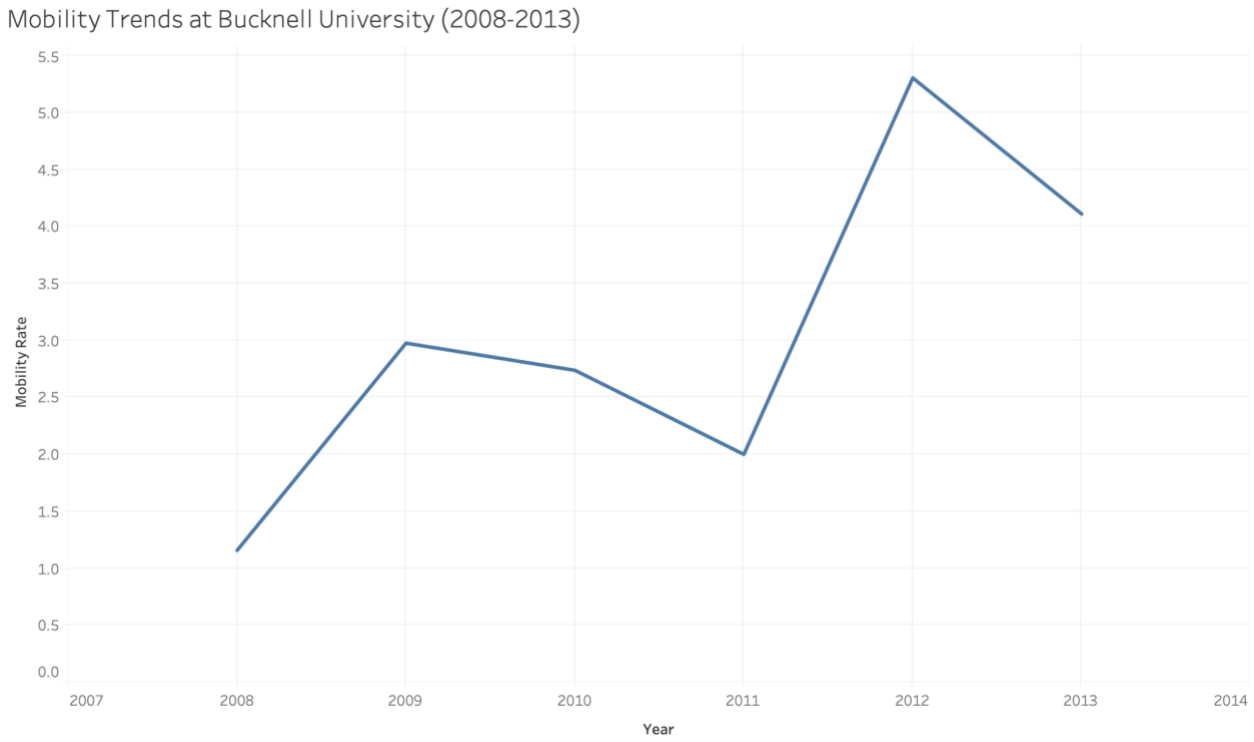
Sum of Median Family Income vs. median of Mobility Rate. Color shows details about Name (group) 5. Details are shown for Name.

Graph C: Percent of Students from Q1 Ending in Q5 Across National Universities

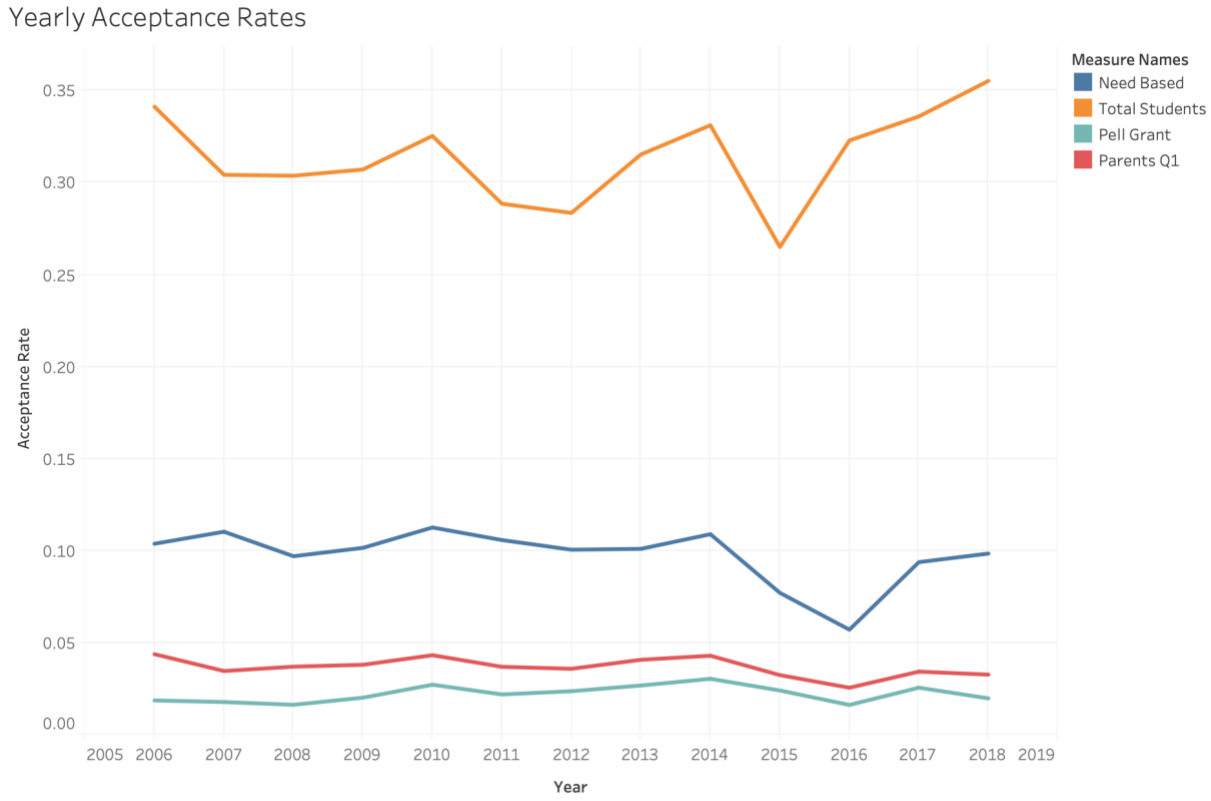


Sum of Par Q1 vs. sum of Kq5 Cond Parq1. Color shows details about Name (group) 4. Details are shown for Name. The view is filtered on Name, which keeps 2,202 of 2,202 members.

Graph D: Mobility Trends from Bucknell University (2008-2013)



Graph E: Bucknell Yearly Trends in Acceptance Rates



The trends of Need Based, Total Students, Pell Grant and Parents Q1 for Year. Color shows details about Need Based, Total Students, Pell Grant and Parents Q1.