

University of San Diego

Digital USD

Dissertations

Theses and Dissertations

2010

Factors Influencing the Decision of High School Graduating Seniors in Corozal, Puerto Rico, to Pursue University Studies

Aned Yarelis Muñiz Gracia EdD
University of San Diego

Follow this and additional works at: <https://digital.sandiego.edu/dissertations>



Part of the [Leadership Studies Commons](#)

Digital USD Citation

Muñiz Gracia, Aned Yarelis EdD, "Factors Influencing the Decision of High School Graduating Seniors in Corozal, Puerto Rico, to Pursue University Studies" (2010). *Dissertations*. 803.
<https://digital.sandiego.edu/dissertations/803>

This Dissertation: Open Access is brought to you for free and open access by the Theses and Dissertations at Digital USD. It has been accepted for inclusion in Dissertations by an authorized administrator of Digital USD. For more information, please contact digital@sandiego.edu.

**FACTORS INFLUENCING THE DECISION OF HIGH SCHOOL
GRADUATING SENIORS IN COROZAL, PUERTO RICO, TO PURSUE
UNIVERSITY STUDIES**

by

Aned Yarelis Muñiz Gracia

A dissertation submitted in partial fulfillment of the requirements for the
degree of

Doctor of Education in Leadership Studies

University of San Diego

2010

Dissertation Committee

Robert Donmoyer, Ed.D.
Fred Galloway, Ed.D.
Rose Linda Martínez, Ed.D.

ABSTRACT

A university education has become a ticket out of poverty for persons living in highly competitive labor markets. Consequently, access to higher education and the factors that motivate university enrollment have long been studied. However, prior to this study, no noteworthy studies with a focus on high school students and their perceptions about higher education had been conducted in Puerto Rico. This lack of research is surprising because Puerto Rico has one of the world's most competitive job markets where a university degree can mean the difference between dependence on welfare and governmental assistance and a life of self-sufficiency and relative affluence.

This study explored the characteristics and motivational forces that drive high school seniors in the three schools of one of Puerto Rico's central towns, Corozal, to either continue or end their formal education after high school. The study employed demographic and personal information data, in addition to responses to questions from a survey instrument administered to all enrolled high school seniors in the town's two public and one private high school. These data were analyzed using descriptive statistics and logistic regression techniques, and, in the case of open-ended responses, qualitative content analysis.

Logistic regression analysis determined that the significant indicators of university attendance among Corozal's high school seniors are grade point average, residence type, maternal education level, private high school attendance, self-reported artistic talent and family size. Among the articulated reasons for not pursuing tertiary studies, respondents listed motivational factors such as needing a break from school, practical considerations such as the need to work to support their child or other family members, and low perceived returns on the time and effort required to get a college degree.

DEDICATION

To my mother, Ana M. Gracia (Gorín)

Learning is often triggered by the most unexpected circumstances. I have long admired my mother, Ana M. Gracia, for countless reasons, and this study gave me yet another source of pride. My mother worked in Corozal's schools as a teacher and as a Guidance Counselor for 33 years. Over her career as an educator and administrator she exercised an impressive amount of unofficial leadership. Students and colleagues genuinely appreciated her and valued her professional opinion. Former students sometimes kept in touch with her for years after graduation. I even remember a few stopping at our house to show her their university grade reports.

Although she retired in 2000, she is fondly remembered in the community and now acted as a sort of "secret weapon", opening doors for me for the realization of this research. My research was approved without a mention of my mother's name early in 2008 by the Superintendent, but unrelated circumstances prevented me from moving forward with it. There was little time once the study was ready to begin in December 2009 and some school personnel had retired in the interim. For example, there was a new Superintendent, a new counselor at the private school and the Esc. Porfirio Díaz had a Social Worker but no Counselor (after a retirement which had not yet been replaced). But it turned out that all these key players had taken classes from my mother, and they immediately and enthusiastically supported this project. Without their collaboration, this study would not have been possible, and it was a pleasure to see their eagerness to help and to receive praise on my mother's behalf. And I was amazed at the swiftness with which everything moved in an island burdened by impenetrable bureaucracy. Although this is not a leadership theory dissertation, it helped me experience and appreciate the positive effects of my mother's diplomatic but efficient leadership style.

ACKNOWLEDGEMENTS

I wish to thank the persons who contributed to the completion of this dissertation.

My “Dream Team” Dissertation Committee: Dr. Robert Donmoyer, Dr. Fred Galloway, and Dr. Rose Linda Martínez.

The staff at all three high schools in Corozal, for collecting the survey data:

- Maribel Padilla, Guidance Counselor, Escuela Superior Emilio R. Delgado
- Vanessa Miranda, Guidance Counselor, Escuela Superior Emilio R. Delgado
- Astrid Rivera Vicenty, Guidance Counselor, Colegio Sagrada Familia
- Adelita Rivera, Social Worker (in the absence of a Guidance Counselor at the Escuela Superior Porfirio Díaz)

To Donatas, for his immense support.

To my family and friends, and everybody else who rooted for me during trying times.

Thanks to those who supported me in one way or another during my doctoral studies: The Grillo-Marxuach family, the House of Puerto Rico in San Diego, MANA San Diego, and my “cheerleaders” and mentors Dr. Strait and Dr. Prestia.

I also wish to thank everyone who endured me, or read and responded to my online comments, between my proposal defense and my research completion, about SPSS not working on my computer, a tree falling on my car, unexpected trips to México in the absence of health insurance, my dog’s apparent tumor, e-mail communications that inexplicably disappeared into thin air, etc. but mostly about statistics and my research. “Venting provides pressure relief”.

TABLE OF CONTENTS

ABSTRACT.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENTS.....	iv
TABLE OF CONTENTS.....	v
CHAPTER 1. INTRODUCTION.....	1
Statement of the Problem.....	1
Background to the Study.....	3
Purpose of the Study.....	6
Research Questions.....	7
Limitations and Delimitations.....	7
Application Status as of January 2010.....	8
Significance of the Study.....	9
CHAPTER 2. LITERATURE REVIEW.....	10
Introduction.....	10
Theories Informing Research about Access and Choice in Higher Education.....	10
The Human Capital Model.....	10
The Utility Theory.....	11
The Economic Demand Theory.....	12
The Rate of Return to Investment.....	12
The Use of Demographic or Personal Factors as Predictors of College Enrollment.....	15
Literature on College Attendance Predictors, Access and Choice.....	16
Important Analyses about Choice, Access and Motivation in Higher Education	
Research Conducted in North America.....	18
The European Continent.....	20
Variables Commonly Used in Studies about Choice and Access to Higher Education.....	22
Interaction among Variables.....	23
Affordability, supply and demand and fiscal factors affecting enrollment.....	24
Ethnicity and Access to Higher Education.....	27
Literature and Data Sources Specific to Puerto Rico.....	29
The Profile of Entering Freshman at Puerto Rican Higher Education Institutions.....	31
Current Research by the University Center for Access.....	33
The High University Attendance Rate among Puerto Rican High School Graduates.....	35
Limitations of the Existing Data Sources.....	37
Conclusion.....	39
CHAPTER 3. METHODOLOGY.....	40

Introduction.....	40
Research Design: Overview and Rationale.....	40
Survey Procedures.....	42
Sites and Participants.....	43
Quantitative Analysis.....	46
Independent Variables.....	49
Variable Coding.....	50
Omitted Variables.....	52
Qualitative Analysis.....	54
Conclusion.....	55
CHAPTER 4. FINDINGS.....	56
Descriptive Statistics.....	56
An Overview of Procedures.....	56
Profile of Corozal’s 2010 Graduating Class.....	57
Profile of students who plan to pursue post-secondary studies.....	59
Profile of students who are <u>not</u> pursuing further education.....	61
Logistic Regression Analysis	62
Correlation Analysis.....	63
Logistic Regression Results.....	64
Individual variables in the final model.....	66
The log of odds of significant independent variables.....	66
Notes about the final model.....	67
Qualitative Analysis Findings.....	68
Reasons for Choosing to Apply to a Particular Institution.....	69
Reasons for not Attending College after High School.....	70
Examples of statements reflecting motivational factors.....	72
Examples of statements reflecting practical considerations.....	72
Examples of statements about low perceived returns from time and effort investment.....	72
An additional reason: wanting or having to wait.....	73
Conclusion.....	74
CHAPTER 5. DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS...76	
Introduction.....	76
Purpose of the Study.....	76
Summary of Findings.....	76
Research Question 1	77
Research Question 2	77
Research Question 3	78
Research Question 4	79
Research Question 5	79
Discussion.....	80
The Statistical Analysis.....	80
The Qualitative Component.....	81

Reasons for Choosing a Particular Institution.....	82
Location.....	82
Curricula.....	83
Cost.....	83
Quality and Prestige.....	83
Family Influence.....	84
Scholarships.....	84
Summary of Findings about respondents' reasons for applying to particular post-secondary institutions.....	84
Observations about vocational program students.....	85
Peer influence or the homeroom effect.....	87
Personal Thoughts from the Researcher	88
Implications and Recommendations for Further Study.....	89
Vocational High School Participants and Analyzing Homeroom as a Variable Legacy: In Extended Families, Who Exerts a Stronger Influence?	89
Confirmation of Residence Type as an Indicator.....	90
An Expanded Qualitative Component with Student Interviews.....	90
Replication with a Different Sample.....	91
Implications for Policy.....	91
Concluding Remarks	94

REFERENCES.....	97
-----------------	----

APPENDIX A: Student Questionnaire (survey).....	106
---	-----

LIST OF TABLES AND FIGURES

Table 1:	Financial Advantage of a College Degree	13
Table 2:	Effects of Education on Selected Non-monetary Indications in the United States	14
Table 3:	February 2010 Unemployment Rates in the United States, by Jurisdiction	27
Table 4:	Description and Coding of Variables in the Model	52
Table 5:	Descriptive Statistics about the 2010 Senior Graduating class from all three high schools in Corozal, Puerto Rico	58
Table 6:	Descriptive statistics about Corozal 2010 high school seniors planning to attend a university	60
Table 7:	Descriptive Statistics about Corozal high school seniors who are <u>not</u> pursuing university studies	61
Table 8:	Correlations Table of significant variables related to university plans	63
Table 9:	Significant variables which increased the likelihood of pursuing university studies among Corozal 2010 high school seniors	65
Table 10:	Reasons listed by Corozal high school seniors for applying to a particular post- secondary institution	70
Table 11:	Reasons given by Corozal high school seniors for not attempting post-secondary studies	71

Table 12:	Reasons given by twenty respondents for not pursuing post-secondary studies immediately after high school graduation	74
Figure 1:	Map of Puerto Rico, with Corozal highlighted	43
Figure 2:	A comparison between the linear and the logistic regression models	48

CHAPTER 1 INTRODUCTION

Statement of the Problem

In part because it is one of the most densely populated areas in the world, Puerto Rico has a highly competitive job market and the highest unemployment rate in the United States. Yet not all students opt to pursue post-secondary education, generally assumed to be a prerequisite for participation in a competitive economy. The reasons that some high school graduates do not pursue further education in a culture that makes it relatively easy for all qualified students to attend college, and in a place where lack of post-secondary education degree has severe consequences, have not been studied.

Globally, there is a substantial amount of empirical work devoted to analyzing factors that may influence increases or decreases in post-secondary enrollment. Some studies, such as the Canadian Youth in Transition Survey (YITS), have been supported or commissioned by foundations or governments to give direction to programs and projects implemented in an effort to reduce educational gaps among underrepresented groups. Institutional research, on the other hand, might be directed at being able to reliably predict enrollment and revenue. Dependent on government support and tuition revenue, many institutions must expand or contract programs based on the number of students who enroll year to year. This may help explain the abundance of studies that seek to predict not only the likelihood of enrollment, but also persistence based on high school variables similar to the ones proposed for this study. (Bedsworth, Colby and Doctor 2006; Seifert and Galloway, 2006).

A respectable amount of studies focus on variables such as race or socioeconomic background and attempt to make generalizations about which kind of persons will most likely pursue higher education (Perna 1999a; 2004b). In general, some findings suggest that regional economies, job market demands, government financial aid policies, and university tuition costs play major roles in enrollment decisions (Chaudhry, 2006). Not surprisingly, several studies suggest that students who are most economically disadvantaged are also those

who are most affected by tuition costs and financial aid policies (Phipps, Santos, and Merisotis, 2005). But Bedsworth and Colby (2006) have also found that career aspirations or the student's expectation that he or she would need a bachelor's degree to pursue the career he or she wished to have at age 30 greatly influence not only enrollment but attrition as well. The same study also found that peer culture is more influential than parental encouragement. This conclusion reinforces the views of a 2002 report by Susan Choy asserting that students are four times more likely to enroll in college if a majority of their friends also plan to attend than if their friends do not. The majority of studies on post-secondary education access and choice have focused on:

- Labor market supply and demand effects on enrollment.
- Socio-economic and financial effects on enrollment.
- Demographics and personal traits: Among the common variables used were migratory status, ethno-cultural background, age and gender.

Despite the proliferation of research written on the subject of enrollment predictors in higher education in the United States and other countries, there have been no noteworthy studies focused on the determinants for enrollment in tertiary institutions by Puerto Rican high school graduates. Furthermore, Puerto Rico presents a unique cultural, socioeconomic and political background and findings from studies in the United States or Latin America cannot be extrapolated and assumed to apply on the island. There is a need, therefore, to study the reasons that Puerto Rican students give for both attending and deciding not to attend higher education institutions. The unique political, cultural and socio-economic situation in Puerto Rico prevents us from making generalizations about the island based on findings applicable to other locations.

Background to the Study

Puerto Rico stretches just 110 miles east to west and 35 north to south, but, with 3.9 million legal residents, it has more people than about half of the states in the USA. There are 46 university systems currently operating in Puerto Rico. Among these 39 are private and 7 public universities. Many consist of multiple campuses, elevating the total of higher education institutions to 98. This provides a great variety in relation to the island's size and its population. These institutions of higher learning enroll approximately 207,000 students a year.

One of the reasons for the proliferation of post-secondary institutions could be that a university education is widely regarded a solid investment for social advancement. The value of higher education in general is supported by public opinion but also scientific evidence. McKinsey (2009) and Mortenson (2005, 2007, 2009) concluded that less educated individuals not only earn less but also generally have poorer health and higher rates of incarceration, among other measures of health, community involvement, and cultural participation. Higher educational attainment was even positively related to happiness levels by Mortenson.

In Puerto Rico, a heavily government subsidized public university system makes it possible for economically disadvantaged students to attend a prestigious (at least in the region) institution at practically no cost to them. Tuition at the University of Puerto Rico (UPR) is currently \$45 per credit unit. The cost of studying at public institutions in Puerto Rico averaged \$1,940 per year in 2008 (College Board, 2008), well below the annual \$6,585 that the College Board estimated as the average cost in the rest of the United States for the same year. In 2007-2008, undergraduate students across the United States received an average of \$8,896 per full-time equivalent student in financial aid, including \$4,656 in grant aid and \$3,650 in federal loans (Viggiano 2008). The American Recovery and Reinvestment Act (ARRA) of 2009 provided \$17.1 billion in additional funds for students across the country in need of Pell Grants \$4,731 to \$5,350 (U.S. Department of Education). The maximum Pell Grant awarded at the University of Puerto Rico was \$4,310 in 2008 according to the university's financial aid office.

It has been noted that exceptionally low tuition costs make it possible for many Pell Grant recipients who are also eligible for subsidized student housing to use most of the grant for personal expenses. The amount remaining after their tuition and housing is paid can even be higher than what many students would earn working part-time for minimum wage during the semester. This means that a university education is economically within reach of most students with an above-average combination of high school GPA and college entrance examination results and who are admitted to the UPR and its satellite campuses. Because of low costs and often with the help of Federal financial aid, students from working families can easily afford tuition and related costs, whereas the most economically disadvantaged students are eligible for scholarships that provide sufficient funds not only for books and tuition but also for food and housing.

In addition, housing costs for student accommodations in Puerto Rico are generally lower. Depending on the level of privacy and comfort, they often range between \$250 and \$500 per month. But for a fraction of needy students, even student housing, typically among the biggest student expenses, is subsidized. The Housing Department of Puerto Rico (Departamento de la Vivienda de Puerto Rico) runs two government-subsidized campus residences at the UPR main campus for low-income students whose families live outside the metropolitan area. The monthly cost of on-campus housing for students who qualify is just \$55 per month. Clothing, food and transportation costs tend to be higher on the island than the United States' average (Collins and Bosworth, 2006) but those are necessary expenses independent of student status or not.

Puerto Rico resembles many of its Latin American counterparts, which often provide public higher education at low or no cost at all, with government funding the sole or primary source of income for higher education institutions. But despite the availability of post-secondary education opportunities at a relatively lower cost, it seems that large populations in Latin America still struggle to take advantage of their opportunities. For example, countries like Brazil and Mexico present large inequalities in terms of matriculation among different socioeconomic groups (Chronicle of Higher Education, 2003).

Although the economic advantages of attending a public university in Puerto Rico are considerable, enrollment is not possible for everyone. Admission to the public university system is very competitive and not all students are admitted to the Universidad de Puerto Rico or its satellite campuses. Since Puerto Rico does not have open-entry public higher education institutions like some European countries or the State of California community college system, the remaining high school graduates seeking additional education usually attend one of the many private post-secondary institutions on the island. Among these are local vocational or career colleges offering quick training for a specific job. A few also enroll in public and private institutions in the United States and foreign countries, most notably in the Dominican Republic and Mexico.

Students in Puerto Rico are eligible for all the same types of student financial aid as all other students in the mainland United States. Federal student financial aid is sometimes complemented by supplementary aid from the Puerto Rican government or private local scholarships, including the Puerto Rico Legislature Scholarship.

Undoubtedly the factors discussed in the previous paragraphs contribute to Puerto Rico reportedly having the highest rate of college attendance among high school graduates in the United States. Yet despite the relative accessibility in terms of cost, variety of locations and incentives provided, and the negative consequences associated with not attending college (McKinsey and Co. 2009:5; Kantrowitz 2007) in a highly competitive job market, not every qualified high school graduate continues post-secondary studies. While there are still jobs that do not require a college education and some individuals are employed in family businesses or other endeavors, a high percentage of high school graduates (and high school dropouts) with no additional studies end up relying on public assistance. This mirrors the reality in the United States, where Mortenson's "Private Correlates for Higher Education" (1995, 2009) and "Reclaiming the American Dream," by William Bedford and Susan J. Colby (2006), summarize the importance of a college education:

In the United States today, a high school dropout is four times as likely to be unemployed as a college graduate is. Assuming he does find a job, he will earn nearly 60% less than his college-educated counterpart. He will be half as likely as his college-educated peers to take part in the democratic process by casting a vote, and half as likely as his high-school educated peers to feel he is in excellent or very good health. As if that weren't enough, he is 2.5 times more likely to be arrested than a high-school graduate is—odds that may help to explain why 82% of the inmates in the criminal justice system are dropouts. (Bedsford and Colby, 2006, p.2)

According to figures released by the U.S. Department of Labor, Puerto Rico suffers from the highest unemployment rate in the United States, and apparently consumes more welfare than average among USA jurisdictions, among other social ills that are traditionally associated with lower educational attainment. While the higher college attendance rates on the island have apparently not resulted in lower unemployment, the high population density and increased competition for jobs makes higher education more important on the island than in the continental United States.

The findings of this study, particularly the reasons that discourage high school seniors from seeking post-secondary education and improving their employment prospects and which are discussed in Chapter 5, should be of interest to policy makers and people in leadership positions.

Purpose of the Study

The purpose of this study was to gain a better understanding of the reasons why students in one medium sized town in Puerto Rico, i.e., Corozal, choose to attend a post-secondary institution. The study also inquired about the reasons why some high school graduates do not continue further studies. While most studies exclude this group to focus on the characteristics of those who do enroll in higher education institutions, the decision to include high school seniors who choose not to attend college in the sample studied sought to

provide a deeper understanding of the motivations of Corozal's high school students concerning college attendance.

Research Questions

This study addressed the following research questions:

- What are the common characteristics of high school seniors from Corozal, PR, who intend to continue post-secondary studies?
- What are the common characteristics of high school seniors from Corozal, PR, *not* planning to attend college, particularly those who have better than average academic qualifications?
- Is there a relationship between demographic characteristics, on the one hand, and students' decisions to pursue university studies, on the other? If so, what variables are associated with this decision?
- What reasons do high school seniors give for planning to enroll in post-secondary institutions?
- What reasons do high school seniors who plan not to enroll in college give for their decision?

Delimitations and Limitations

This study gathered survey responses from most graduating students in selected schools, but measuring an entire population might not have been accomplished. Despite student absences and the voluntary nature of the questionnaire, school officials reported that virtually all students enrolled did participate; as a result, no official response rate exists.

Another limitation related to Research Questions 4 and 5. These questions relied on interview questions that did not differentiate between plans to enter a university degree program and other forms of post-secondary education such as short-term vocational studies programs. Consequently, while data that were relevant for answering the first three research

questions were analyzed by separating the respondents in two groups according to their university attendance plans, the two groups considered in the responses to the fourth and fifth research questions were those planning to attend any form of post-secondary education and those not planning to go on to any additional education. Thus, there was a lack of comparability between the responses to the first three research questions, on the one hand, and the fourth and fifth questions, on the other.

This study was conducted with the expectation of obtaining a reliable picture of high school seniors from Corozal, but responses were specific to the individual students' unique circumstances. While no attempt to generalize at an island or national level is being made, the results from this study can help policymakers gain a better understanding of the reasons that encourage or discourage college attendance in central mountainous towns. The way of life and therefore students' circumstances in other middle-sized rural towns might be comparable, particularly in the neighboring towns of Morovis, Orocovis, and Naranjito, which resemble Corozal in terms of size, location, topography, population, and the lack of a higher education institution located within their boundaries.

The data used for this study was self-reported by the students. As such, the possibility of error, intentional or unintentional, exists within the respondents' answers.

Application Status as of January 2010

It should be noted that the questionnaire data were collected in the second half of January 2010, and students had not received acceptance or rejection letters from institutions or financial aid offers at the time the data were collected. This might have resulted in an overestimate of the eventual postsecondary institution attendance rates.

It is also possible that the eventual enrollment figures could rise. Many private colleges and universities accept late applications and, in the case of vocational career colleges, students can delay their official enrollment until the end of the summer. This means that

eventual higher education enrollment rates from the 2010 graduating classes of Corozal schools could actually be higher than what the collected data imply.

Significance of the Study

Despite the proliferation of research written on the subject of enrollment predictors in higher education in the United States and many other countries, there were no noteworthy studies focused on the determinants for enrollment in tertiary institutions among Puerto Rican high school graduates.

This is the first academic research study about education carried out in Corozal's schools but also the most comprehensive study about access and choice in the Central Mountainous Region of Puerto Rico, which includes the neighboring towns of Barranquitas, Morovis, Orocovis, and Naranjito. Data from the schools in Corozal, including data about graduating seniors, had largely been estimated.

In addition, this study contributes to the body of empirical research about the factors that influence a high school graduate's decision to enroll in an undergraduate institution. It can be used by policy makers and also post-secondary institutions seeking a better understanding of their market.

CHAPTER 2 LITERATURE REVIEW

Introduction

What can educators and administrators do to improve the chances of high school graduates attending college and reaching their full potential? How can we discourage dependence on welfare and foster the development of more productive individuals? Before we determine the relevant factors that influence college attendance and ponder the best ways to promote education, familiarization with the literature related to this research and the ideas guiding it is necessary. The body of research about college attendance, choice and access is expansive. For this reason this chapter will organize and briefly summarize the major theories informing research about access and choice in higher education, followed by an overview of important works about demographic and motivational factors influencing decisions to enroll in post-secondary education, and close with the available information specific to Puerto Rico.

Theories Informing Research about Access and Choice in Higher Education

A considerable amount of research about college attendance, access and choice is based on economic theory and its supporting theories. Among them, the human capital theory, demand theory, and utility theory have often informed research about access and choice in post-secondary education. The economic value of higher education is measured and analyzed in terms of returns to investment in many research studies and publications.

The Human Capital Model

Considerable research on college attendance tendencies is based on the human capital model promoted Nobel Laureate economist Gary Becker (1964), who studied the motivation for many aspects of human behavior by analyzing their incentives. According to this theory, a high school graduate enrolls at a post-secondary educational institution as an investment in future earning power. Individuals may calculate the value of post-secondary education by

comparing costs, which may be direct like tuition, and indirect like lost wages and time, with expected financial gains, and make the decision they think will maximize their career potential and earnings over the long term. To understand enrollment behavior, according to this model, it is necessary to look at factors such as tuition, available financial aid, average salaries for high school graduates, typical job opportunities and the difference in lifetime earnings between high school and university or college graduates. In countries with a socialized higher educational system that provides higher education to all qualified prospects, often at no cost to them (e.g., Sweden, Finland, Denmark, Hungary, Ireland, Cuba and Venezuela), it may include other factors such as the additional benefits reaped by achieving and maintaining student status. The incentives for attending higher education vary enormously by country and may include travel, public transportation and banking discounts, rent and utility subsidies, and the opportunity to apply for international internships, student visas, short-term jobs abroad and government subsidized exchange programs such as “ERASMUS” (European Region Action Scheme for the Mobility of University Students) in the European Union (The Erasmus Programme, 2010).

The Utility Theory

Utilitarianism was promoted by thinkers such as Jeremy Bentham and John Stuart Mill in the late eighteenth and nineteenth centuries. It sought to explain economic behavior in terms of increased worth, benefits, or happiness. Utility is often modeled to be affected by consumption of various goods and services, possession of wealth and spending of leisure time. According to this theory, a consumer chooses the option that maximizes, or is expected to maximize, his or her satisfaction level.

In higher education, utility theory proponents propose an analysis of choice based on economics, which implies that choice is a consumer’s decision made after considering price, available resources, and preferences. In the seventies, Henderson and Quandt (1971) promoted the consumer’s utility function, and Willis and Rosen (1979) studied whether high school graduates decide to continue their studies or begin working based on the utility they associate with each option.

The Economic Demand Theory

Henry Schultz, a founder of the Econometric Society, did pioneering work on the theory and measurement of consumer demand in the 1920's and 30's. The economic demand theory sustains that the rate of acquisition or demand for goods and services is related to their price and that of competing products or services, the buyers' acquisitive power, and their tastes or preferences. Price variables like gross tuition, net (or discounted) tuition, grants and loans were studied for their effects on enrollment by Heller (1997) and Leslie & Brinkman (1987). According to these studies, decreases in the net price, which means the cost of tuition minus the portion covered by grants, result in higher enrollment rates.

The Rate of Return to Investment

The returns to investment on higher education can be significant for both the individual and society. In the United States, the possible benefits to the individual could justify increased enrollment despite tuition inflation and an adverse economy (see Table 1). Despite the current economic downturn and rising tuition, the college continuation rate for recent high school graduates was at a record high in October 2008, according to the United States' Bureau of Labor Statistics. This suggests an increasing willingness to invest in education, possibly motivated in part by the desire to strengthen one's marketability.

Table 1
Financial Advantage of a College Degree

	1997-1999	2003-2005	2005
Bachelor's Degree vs. High School Graduate	\$914,289	\$1,181,903	\$1,210,760
Doctoral Degree vs. Bachelor's Degree	\$1,299,137	\$1,742,759	\$1,707,280

Note: 1997-1999 figures are in constant 1999 dollars; other figures are in constant 2005 dollars. Adjusting the 1997-1999 figures for inflation to obtain constant 2005 dollars would require increasing the figures by 17.2%.

Source: *The Financial Value of a Higher Education* by Mark Kantrowitz (2007)

Society also stands to benefit from a more educated population, as evidenced by several authors, including Tom Mortensen (1995; 2009) in "Private Correlates of Educational Attainment" (see Table 2). Despite the "private" label in his title, Mortenson measures many outcomes of societal benefits by educational levels and concludes that, for example, more educated individuals not only collect less welfare and pay more taxes, but also have lower crime and incarceration rates, are less likely to be involved in catastrophic accidents, are more involved in their communities and volunteer more hours.

Table 2
Effects of Education on Selected Non-monetary Indications in the United States

	Educational Attainment			
	Less Than High School Graduate	High School Graduate	Some College	Bachelor's Degree or Higher
Percent of Life Economically Active from Birth				
Male	49%	57%	57%	59%
Female	29%	39%	39%	45%
Deaths per 100,000 for Persons 25-64 Years of Age	515.1	426.1	218.1	218.1
Mothers Who Smoked Cigarettes During Pregnancy	31.1%	18%	10.4%	2.6%
Breastfeeding by Mothers 15-44 Years of Age	43%	51.2%	65.9%	80.6%
Volunteer Work	29.9%	40.4%	56.7%	67.2%
Voted (in 1996)	38.8%	51.7%	63.1%	77%

Source: Mortenson, Postsecondary Education Opportunity, March 1999

The social rate of return compares the costs and benefits of education to society as a whole and is more difficult to measure. Yet publicly funded programs that seek to increase the number of college educated individuals in a society seems to acknowledge the public interest in promoting higher education.

The private rate of return for education is easier to determine and has generated a larger body of research. The returns of investment in human capital has been estimated by comparing the cost of tuition and productivity loss (lost wages) to the expected or actual wages, using present value calculations to compare costs and benefits at the same point in time. According to Becker, who wrote repeatedly concerning the rate of return of a college education, in 1939 the rate of return was approximately 13% and decreased to 11.5% in 1949, ten years later (Becker, 1975, 1993, 1994). He used least squares and made adjustments to compensate for different ability levels in his model. But these observations focused on urban,

native-born white males in the United States over 50 years ago. However, Becker's theories influenced subsequent work by Hartog, Card, Kane and Rouse, among others. There are at least five studies spanning three continents that explore the return rate to education among twins, on the assumption that twins provide almost perfect comparison on which the effect of one variable will be less affected by others such as socioeconomic background, peer and cultural influence, and innate ability (Ashenfelter and Rouse, 1999; Rouse, 1997; Miller *et al.*, 1995; Isacson, 1999; Ashenfelter and Zimmerman, 1997) .

In addition, researchers such as Pascarella and Smart (1990) analyzed the benefits of education from different perspectives than the private rate of return on human capital investment models. The first study used college grades as a predictor of higher wages and the second study determined that the investment in student aid programs more than paid for itself, as the additional tax revenues attributable to federal student aid amounted to \$4.30 for every dollar spent.

In general terms, a large body of research supports the broadening of access to higher education as a positive influence for both individuals and society at large. Studies concluding that higher education is positive for the general society and for the economic and social advancement of a country might contribute to the current and perhaps future surge in interest in this field, particularly in Third World countries and less studied regions.

The Use of Demographic or Personal Factors as Predictors of College Enrollment

In addition to the body of research on higher education access and choice completed from a purely economic perspective, personal and demographic factors, among other non-monetary considerations, can also play a major role in post-secondary educational decisions. Studies conducted in many communities explore a number of background variables that complement economic factors to influence educational plans beyond high school. Variables that are often studied and have been found to be relevant include both personal traits like academic ability, demographic factors like race and gender, and interpersonal factors, such as the level of encouragement (including passive or implied) a student receives from parents and

teachers (Hossler and Stage, 1992). Immediate family members' own educational achievements in and of itself, for example, can be a factor in determining whether a high school student decides to attend or not attend college (Maple and Stage, 1991).

The largest body of scholarly research about college preferences, access and tendencies appears to have been carried out in areas with stronger economies, such as North America and Europe. However, it should be noted that there may be additional studies from developing countries that might not have been published on scholarly journals or entered into databases that can be accessed from abroad. A brief overview of the known relevant works in this field will now be presented.

Literature on College Attendance Predictors, Access and Choice

What background factors and thoughts contribute to whether an individual chooses to pursue an education beyond high school? Researchers in the fields of economics, public policy, and sociology have studied college enrollment from the perspective of the students, the institutions, and social policy (Seifert and Galloway, 2006). The motivation driving high school graduates to seek post-secondary education, their choices, possibilities, enrollment figures, and persistence are widely studied topics on a global scale, although in general countries with a stronger and richer economy seem to have produced more related research. In the United States alone there is vast literature related to college access and choice, as well as on behavior and traits associated with college attendance.

The amount of research increased exponentially after the Higher Education Act of 1965 was approved in the United States of America. This legislation authorized the federal government's major student aid programs, including the Commonwealth of Puerto Rico, and resulted in increased access to higher education. Interest in the field by educators, economists, sociologists, policy makers and the general public rose soon after.

While the motivation for these studies may come from many sources, including taxpayers' concern with the proper utilization of resources, foundations that promote access to

higher education and mentoring and scholarship programs like the Lumina Foundation, the Hispanic Scholarship Fund, Soroptimist, MANA, a National Latina Organization, and the Western Interstate Commission for Higher Education (to name a few among a vast number of likely minded organizations) apparently share a genuine interest in further expanding access to higher education with both advocates and researchers.

A concern is that after decades of explosive growth, access became more limited when years of repeated price increases affected many students' ability to pay for an education and, therefore, reduced choice within and then access to higher education (Thomas and Perna, 2004). As William Kirwan, former President of two large state universities and Chair of the United States' College Board's Commission on Access, Admissions and Success in Higher Education, states on the commission's website, "The effect of diminished access has a devastating impact on the lives of individuals seeking advancement through education and on our collective hopes for advancing our society's interests and welfare." (Kirwan, 2008)

In recent years, we have seen a growing number of studies that focus on, first, measuring the different ratios in postsecondary participation between groups sharing similar characteristics and, second, explaining the reasons why certain groups are under-represented in post-secondary institutions (Bergen, Motte and Parkin, 2009; Brusi, 2009; Choy 2002). Many studies are supported by the increased availability of new and often complex data collected by governments, institutions, foundations and private researchers. Examples of these are entering freshman class profiles completed by Sandra Dika (2004) for the Universidad de Puerto Rico, the Canadian government's Canadian Youth in Transition Survey (Thiessen, 2009), research supported by foundations such as the Lumina Foundation for Education, the Proyecto Carvajal para la Democratización del Conocimiento from the Carvajal Foundation, and Thomas Mortenson who works both for his own Postsecondary Education Opportunity Seminar and The Pell Institute for the Study of Opportunity in Higher Education. As a result, most North American and European countries have recently expanded and updated their data and understanding about predictors of greater or lesser participation in tertiary studies among specific population groups.

Important Analyses about Choice, Access and Motivation in Higher Education

Research conducted in North America. In 1987 Larry Leslie and Paul Brinkman published an important review of the literature on the relationship between price and enrollment in higher education. They reviewed 25 quantitative analyses of this relationship, which varied in their data sources, methods of analysis, and population studied. In their subsequent book, *The Economic Value of Higher Education*, the authors reviewed 45 econometric analyses of the relationship between student financial aid and college enrollment. Leslie and Brinkman stated that student demand research was important because "expanding and equalizing student access long has been a major public policy goal, and manipulation of price has been seen as the major policy instrument for achieving this goal" (p. 182).

The authors of this important work offered a critical review of the concepts and methods used in the economics of higher education up to the late eighties. The discussion includes findings about the economic effects of higher education on both private investors (individuals who make college investment decisions) and public policy makers (those who allocate funds for higher education). This book provides a brilliant discussion of the contributions of education to the U.S. national economy, the economic impact of colleges on their local communities, and the rates of return to higher education. It also reviews the effects of increased tuition on enrollment, the equity effects of the combination of higher education financing and enrollment patterns and the effects of student financial aid. The findings of the book confirm the significant economic value of higher education, locally and at the national level, for students, colleges themselves, and society as a whole.

Although the Leslie and Brinkman review was comprehensive at the time it was published, the most recent data they analyzed were from the early 1980s, with most studies using samples from the 1970s and earlier. These studies could not capture the effects of the dramatic increases in real tuition prices during the 1980s, 1990s and 2000s. Furthermore, the ensuing years since the publication of Leslie and Brinkman's work have seen the release of a myriad of student demand studies that add more information to our understanding of the relationship between price and higher education enrollments. Many of these new studies look

at the effects of different forms of financial aid separately from tuition changes. In addition, many focus on the effect of tuition and aid changes on students of different income categories, races, and in different college sectors.

Among North American studies, the Canadian Youth in Transition Survey (YITS) was crafted to explore transitions and educational choices. The data analysis by Berger, Motte and Parkin (2009) examined the predictors for post-secondary enrollment and grouped them in five major categories. Categories include such factors as:

- Individual characteristics such as gender and age;
- Familial socio-economic factors, including parental level of education, family income, family structure, parental employment, mother tongue and ethnic or cultural origin;
- Factors linked to academic performance: having a high school diploma, having taken the prerequisite courses for admission to a given program (e.g. advanced mathematics) or having a grade average enabling individuals to be admitted to the program of their choice;
- Individual behavioral factors such as motivation, aspirations, preferences and types of activities; and
- Factors related to the environment in which youths live: friends, distance from home to a post-secondary institution, institutional accommodation capacities and requirements, economic conditions in their region, availability of information, availability of guidance counselors, tuition fees and student aid policies (Berger, Motte and Parkin, 2009).

As Berger, Motte and Parkin (2007) have argued, factors are often inter-related and cumulative. For example, a Canadian youth with a poor academic record may be less motivated to continue studies, especially if he or she lives in a region with low unemployment and can therefore assume that higher education might not make much of a difference in terms of employment. In a similar vein, but using a slightly different combination of factors, Thiessen (2009) concludes that the participation gaps observed for Aboriginal, immigrant and visible minority groups in Canada cannot be attributed to a single set of factors.

Thiessen's Canadian study closely examined the actual participation gaps between boys and girls, youth from lower and higher income families, youth from different regions of Canada and Aboriginal and non-Aboriginal youth, guided by an understanding that depending on the group of individuals studied, a given factor can play a more or less important role. The reasons why a Canadian boy might not be motivated to pursue post-secondary studies may well differ from the reasons a girl is not motivated to do so. Similar findings occur in other jurisdictions. Junor and Usher (2004) and Berger, Motte and Parkin (2007) also devised categories related to information, motivation, academic performance and finance. These groupings were mainly based on answers provided by survey respondents to explain why they might not participate in post-secondary studies.

The European continent. Studies about choice and access to higher education have also become commonplace in other continents. *Education and Earnings in Europe* by Harmon, Walker and Westergaard (2001) presents the findings of a European Union study titled "Public Funding and Private Returns to Education". This government-sponsored research sought to estimate private returns to education comparing the relationship between wages and education among different European countries. In addition, more governmental scrutiny and public interest is to be expected. Access to higher education and expansion has continued, in most countries at a rate not experienced since the 1960s. The private sector has expanded rapidly, in particular, in central and eastern Europe (although not as rapidly in the immediate post-Communist years) although the bulk of students continue to be enrolled in public or non-profit private institutions (Santiago *et al* 2008, Vol 1, Fig 2.5, p 46) that are largely or even entirely subsidized by the government. As quoted by the chairs of the Research Advisory Group of the Leadership Foundation for Higher Education Sir **Peter Scott**, (who is also Vice-Chancellor of Kingston University, United Kingdom) at the 2008 UNESCO Forum on Higher Education in the Europe Region: Access, Values, Quality and Competitiveness:

In the United Kingdom the total number of students in tertiary education increased from 1.94 million in 1998 to 2.34 million in 2006. In Sweden the growth rate was even more rapid – from 280,000 to 423,000. In Poland student numbers increased by almost

90 per cent over the same nine-year period (from 1.19 million to 2.15 million). There were rapid growth rates in many other central and eastern European countries (with private institutions increasing their overall share of student numbers). In the other major western European countries, apart from the United Kingdom, growth was slower. In France the total increased from 2.03 million to 2.2 million; in Germany from 2.1 million to 2.29 million; in Italy from 1.87 million to 2.03 million; and in Spain from 1.75 million to 1.79 million. The total number of tertiary-level students (university and non-university) in the 25 countries of the European Union plus Norway, Turkey, Croatia and the Former Yugoslav Republic of Macedonia increased from just over 15 million to 18.8 million. In terms of the total number of graduates (Bachelor's, Master's and doctoral awards) a similar pattern can be observed. Once again one of the most rapid growth rates was in the United Kingdom – from 374,000 in 1998 to 514,000 nine years later. The Czech Republic produced the most impressive increase in central and Eastern Europe – up from 22,000 to more than 60,000. Even in France (356,000 to 435,000), Germany (213,000 to 311,000) and Italy (164,000 to 380,000) there was substantial growth in the number of graduates, reflecting perhaps the lower wastage rates which were one of the (implicit) objectives of the move to a Bachelor's / Master's pattern as a result of the Bologna process (OECD 2008, European Commission 2008a, 173-179, 180-182).

One example among countries that provided open access to higher education and experienced massive growth is the Central European nation of Austria.

Following the General Act for University Education of 1966 and the University Organization Act of 1975, enrollment at Austrian universities rapidly increased (Winkler, 1997). Austria has a long tradition of tertiary education which began in 1365, but enrollment was mostly limited to the intellectual and social elites. The number of students enrolled in Austrian institutions of higher education increased from about 19,000 to more than 200,000 between 1955–1956 and 1991–1992. This “dramatic expansion” has been criticized by some and partially blamed for the ensuing lower graduation rates. As a result, enrollment caps and tuition fees were introduced to a system that previously accepted (and subsidized by providing free tuition) every graduate who passed the Matura, or Austrian academic high school exit examination. This relationship between free access and greater enrollment numbers has been confirmed in other European countries. In Ireland, the abolition of fees for tertiary schooling also resulted in increased participation (Denny and Harmon, 2000). This trend might be reversed to a certain extent after some of the countries offering free higher education begin charging tuition, a necessity created by the current economic downturn.

Variables Commonly Used in Studies about Choice and Access to Higher Education

Further exploration of the research literature can also serve to explore the variables used in similar studies and therefore support the choice of variables proposed for this study. For example, in the National Longitudinal Survey of Children and Youth (NLSCY), which is carried out by Canadian authorities every two years, the data show a gap of 13 percentage points between girls and boys in the rate of high school completion in Quebec among 18 to 23 year olds (Thiessen, 2009). A similar situation is evident in the United States and Puerto Rico, indicating females have had higher high school graduation rates than males for many years. Although Álvarez *et al.* (2004) and Ladd and Rivera-Batiz (2006) documented this inequality, disparity in college attendance by gender lines in Puerto Rico is obvious even to the naked eye of someone casually visiting an island university campus. Gender is, quite expectedly, among the variables measured in this study.

Studies relating each one of the selected demographic variables to college enrollment have been carried out in many places outside of Puerto Rico. For example, parental educational levels have been widely studied in North America but also in other continents. Fanta *et al.* (2007) summarized mixed methods studies in Austria, Europe, which found that socioeconomic background can accurately predict the kind of school path a given student will choose to attend with almost 70% of accuracy. In Austria, only students who attend a “Gymnasium” type of high school and obtain a “Matura” exit examination can enrol in their local universities. If the parents did not complete high school (Gymnasium) it is very unlikely that their children consider going, and therefore will not be eligible to enter an Austrian university. If the parents did complete a university degree the chances of their children studying at the university are extremely high, 89% for the years studied. Besides parental education, more traditional variables such as student grades have also been studied at an international level. In Germany, Trapmann *et al.* (2007) asserted that the most widely studied correlation has been that between university enrollment and performance and high school grades. Parental education and high school grade point average are also among the variables used in this study.

Using National Educational Longitudinal Study (NELS) data to examine enrollment decisions by twelfth graders in the United States, Perna (2000) found that students in urban and rural schools actually were more likely to go to college than their suburban counterparts, controlling for student characteristics and a series of other factors. Student transition from grade 12 to college is a research area of significant policy importance. However, it alone may not adequately address the disparity in postsecondary opportunity because some disadvantaged students dropped out of school before reaching their senior year (Alexander, Entwisle, & Kabbani, 2001; Orfield, 1988). Students in this study were also analyzed according to their high school type, which included public urban, private urban, and rural public.

Institutional research has also become commonplace, as colleges and universities try to ascertain the best approach to ensure their projected enrollments as well as how to target their desired student body. Descriptive statistics often aid institutions in marketing and accreditation efforts. For example, the Universidad de Puerto Rico has included incoming freshman descriptive statistics in newspaper advertisements, such as the ones published in August 2005, 2006 and 2007 in *El Nuevo Día*. A constant source of data is government-produced or initiated studies regarding enrollment patterns and factors affecting postsecondary enrollment. This is evidenced in the island's first attempt to describe its college population, which used data provided to the government by each postsecondary institution.

Interaction among variables. In his 1997 article for the *New Direction for Institutional Research* journal titled "Enrollment Forecasting and Revenue Implications for Private Colleges and Universities", James H. Day confirms that many models built on logistical regression techniques (Perry, R. and Rumpf, D., 1984) explain matriculation as a function of multiple variables. The interaction between variables is a recurring topic also discussed by Bergen, Motte and Parkin (2009). In 1998, the U.S. Department of Education published a study that claimed:

The factors affecting enrollment in college can be divided into two general types: those specific to individual students, such as academic achievement and parental education levels, and those specific to educational or vocational alternatives, such as

college tuition, financial aid, and unemployment levels. Students' enrollment decisions can be viewed as jointly determined by their individual characteristics and the institutional or societal conditions that prevail. (p.4)

The variables studied by Day (1997) were grade point average, college entrance test scores, class rank, the rigor of high school curricula, gender, status as an alumnus or alumna son or daughter, parental education attainment, state of residence, extracurricular participation, outside interests, and various indicators of family financial capability, including whether an aid application was made, the projected level of need, and the estimated family contribution. As previously mentioned, his choice of variables resembles those often used in similar studies, such as "The Price of Knowledge: Access and Student Finance in Canada" by Berger, Motte and Parkin (2009). The variables most commonly found to have an effect on university attendance were also analyzed in this study, although a few, like class rank, are specific to the United States and do not exist in Puerto Rico.

Affordability, supply and demand and fiscal factors affecting enrollment. Fiscal factors appear to be a major focus among studies about access and choice. There is widespread sentiment and multiple studies that support or suggest access and choice are influenced by affordability and market conditions. Even the effect of student debt, including undergraduate student loan obligations, has been shown to be a factor in some persistence studies. In *Rising Debt Hits Access Efforts*, Goddard (2000) suggests that student debt deters the enrollment of poorer students more than advantaged students. Three years later, Millett (2003) revealed that "students with debts of \$5000 or more were significantly less likely to apply to graduate or first professional schools than their peers who did not have educational debt".

Many reports examine the role of labor, market supply and demand factors in post-secondary enrollment decisions (Ludwig *et al.* 1986; Murray, 1985), while others evaluate and examine socio-economic influences on student enrollment patterns. For instance, *Economic Segregation of Higher Education Opportunity, 1973-2001* (2003) describes "the way higher education enrollments in U.S. colleges and universities are rapidly being sorted by family income and social class." In *Changes in the Wage Structure, Family Income and Children's*

Education (2000), Acemoglu and Pischke state that the substantial enrollment increases that occurred between 1982 and 1992 were concentrated among students from upper income families, while enrollment by students from lower income families remained stagnant. Other articles examining the connection between enrollment and socio-economic (dis)advantage are Berkner and Chevez (1997), Braunstein *et al.* (1998), and Halstead (1998), while Mangan (2002), explored workers' enrollment in professional programs as a path to skill improvement to become more marketable. The responsive relationship between the economy and labor market needs and enrollment in tertiary institutions is another theme. One focus tends to be on the positive relationship between demand for people to fill high-level professional jobs such as those in technology and engineering, and matriculation in corresponding post-secondary disciplines. Another is the relationship between a worsening economy and increasing enrollment in postsecondary institutions.

Buss *et al.* (2004), Fitzgerald (2004), Seifert and Galloway (2006) and Vasigh and Hamzasee (2004) identify interacting influences among tuition, financial aid policies and students' socio-economic status. Buss *et al.* (2004) state that students who are more economically advantaged possess "tuition elasticity close to unity", meaning "a 1% increase in tuition will lead to about a 1% decrease in enrolment [sic] yield." However, the correlation between tuition increases and decreasing affordability and enrollment seems to be greater for students requiring financial assistance. Tuition and room and board costs negatively affect enrollment to a greater extent for more economically disadvantaged students, while grants and loans have a stronger positive effect. Among those who explore these issues, Vasigh and Hamzasee (2004) also examine tuition, income, financial aid and unemployment as factors which may affect enrollment. In the private university they studied, enrollment increased despite increases in tuition, suggesting that those in the higher income brackets are less sensitive to tuition costs. Mooney (1987) and Grassmuck (1990) are among a large group of authors who studied family income levels, academic achievement and ethnicity as factors affecting enrollment.

Not surprisingly, affordability and access to education remain a hot topic among researchers and policy makers. In 2002 Paulsen and Eric conducted a study in which finances

were deemed a major determinant of student choice and access. Many researchers like Perna (2004) and Mortenson (2001; 2005) have also found that income continues to limit access and choice in higher education, particularly among Hispanics in the United States. Data compiled by Mortenson in 2005 indicate that persons from the top quartile of family income in the United States were nearly nine times more likely to earn a bachelor's degree than persons from the lowest quartile. Only about 6% of lowest quartile earners obtained a bachelor's degree by age 24.

Limitations exist in using the income variable and the aforementioned economic models in the Commonwealth of Puerto Rico. Statistical contradictions are commonplace on the island. For example, despite having the largest college attendance rates in the United States, Puerto Rico also has the highest unemployment rate of any U.S. jurisdiction (see Table 3). Since only 43% of the population over age 16 is employed, the unofficial unemployment rate should be closer to 50%. This would also contradict Gary Becker's utility theory, or at least affect its applicability on the island, since higher education by itself might not suffice to guarantee stable employment.

Table 3
*February 2010 Unemployment Rates in the United States, by Jurisdiction **

<i>State</i>	<i>Unemployment</i>	<i>State</i>	<i>Unemployment</i>
Puerto Rico	16.0%	Connecticut	9.1%
Michigan	14.1%	Pennsylvania	8.9%
Nevada	13.2%	New York	8.8%
Rhode Island	12.7%	New Mexico	8.7%
California	12.5%	Wisconsin	8.7%
South Carolina	12.5%	Alaska	8.5%
Florida	12.2%	Maine	8.3%
DC	11.9%	Texas	8.2%
Illinois	11.4%	Arkansas	7.7%
Mississippi	11.4%	Colorado	7.7%
North Carolina	11.2%	Maryland	7.7%
Alabama	11.1%	Wyoming	7.5%
Kentucky	10.9%	Louisiana	7.3%
Ohio	10.9%	Minnesota	7.3%
Tennessee	10.7%	Virginia	7.2%
Georgia	10.5%	New Hampshire	7.1%
Oregon	10.5%	Utah	7.1%
Indiana	9.8%	Hawaii	6.9%
New Jersey	9.8%	Montana	6.9%
Arizona	9.5%	Iowa	6.7%
Idaho	9.5%	Oklahoma	6.7%
Massachusetts	9.5%	Vermont	6.6%
Washington	9.5%	Kansas	6.5%
West Virginia	9.5%	Nebraska	4.8%
Missouri	9.4%	South Dakota	4.8%
Delaware	9.2%	North Dakota	4.1%

Source: U.S. Dept. of Labor, Bureau of Labor Statistics, rearranged in descending order.

** Preliminary figures released March 26, 2010.*

Ethnicity and access to higher education. Another common variable in studies about choice and access to university education is ethnicity. Perna (1999) sought to explain why despite an increase in the predisposition toward college, only 28 percent of African Americans and twenty percent of Hispanics in the United States enrolled in a four-year

institution the Fall after high school graduation. The study concludes that when the econometric framework is expanded to include measures of social and cultural capital, college choice does not conform to a rational choice model. The findings suggest several reasons why African Americans and Hispanics are less likely than whites and Asians to enroll in a four-year college immediately after high school graduation. Important factors included their underrepresentation among students enrolled in at least one high school advanced mathematics course. For Hispanics, another barrier appeared to be related to the level of parental involvement. For African Americans, the decision is influenced by the values, norms, and characteristics of the high school attended. Her subsequent study about race and ethnicity suggested that college enrollment might not be dependent on race and ethnicity per se, but that different discouraging factors affect the college choices of African-Americans and Hispanics (Perna, 2000).

Race and ethnicity have often been found to carry significant weight in students' decisions to pursue tertiary education and where to pursue it. The effect of this variable on the likelihood of pursuing further studies in North America is widely known. For example, in 2000 persons self-described as "white" between the ages of 25 to 64 were twice as likely as African-Americans to have a bachelor's degree, and almost three times as likely as Hispanics/Latinos (National Center for Public Policy and Higher Education 2005). The National Center for Higher Education Management Systems (2000a, 2007b), Hagy and Farley (2002), as well as Hurtado, Inkelas, Briggs and Rhee (1997), among many other researchers, found significant racial and ethnic group differences in preparation behaviors, college application behavior (number of colleges to which students applied), and attendance at their first choice of institution. These findings make ethnicity an important variable for studies conducted in the United States.

On the other hand, while Puerto Rico is politically part of the United States of America, it is also a Caribbean island with a distinct culture and identity closer to Latin America. This is reflected in its language, bureaucracy and the fact that the term "Puerto Rican" denotes an almost homogeneous cultural or ethnic background despite the plurality of its DNA sources. Puerto Rico is routinely excluded from studies and databases about higher

education in Latin America, presumably because it is not an independent country, and is also absent from many datasets compiled by the United States' Department of Education, presumably because it is also not a state. And the complexity of its own circumstances difficulties a comparison to either region. Consider the following statement presented by DeWitt to the UNESCO and The World Bank in 2005:

Enrollment in higher education has more than doubled in the past decades and continues to expand, educational opportunities have diversified, and university management has been decentralized to increase responsiveness to students and industry. Nonetheless, the potential for higher education remains unrealized in Latin America. Graduation rates are low, higher education institutions face a multitude of quality problems, inequities are widespread, and there is a mismatch between many specialties offered and the needs of the labor market. (DeWitt, 2005, p.22)

While the first sentence could also apply to Puerto Rico, the two that follow describe a state consistent with third world countries and not the reality of an island with one of the highest college attendance rates among high school graduates. Since neither Latin American nor United States' data and conclusions can be assumed to apply in Puerto Rico, the scarce studies conducted in the island gain importance in this literature review about enrollment tendencies, choice and access to higher education.

Literature and Data Sources Specific to Puerto Rico

This section will present the major findings of relevant studies conducted in Puerto Rico. However, a few major observations should be mentioned at the outset of this review:

- The number of studies on college attendance in Puerto Rico is limited.
- Most data available were collected for institutional research and focused on the institution doing the study.
- The main study attempting to use statistical data to determine similarities among students enrolling at different post-secondary institutions relied on incomplete sets of data. A more statistically reliable study, completed by Sandra Dika, is awaiting publication.

Most data available about Puerto Rican college students prior to 2010 was collected via institutional research. Consequently, these inquiries focused on analyzing the characteristics of the student body or incoming class at a particular university or campus. At least one study, “Perfil del Ingresado a las Instituciones de Educación Superior de Puerto Rico, 1996-2002”, led by Álvarez, Camacho-Isaac and Figueroa (2004) tried to combine these data sources to produce a global view of students attending institutions of higher learning on the island. They relied on data reported by the institutions to the Puerto Rican government. But the study, although ambitious in its scope, had several limitations due to major omissions in the data sets that even the authors recognized. A promising and ambitious study, *Proyecto Carvajal para la Democratización del Conocimiento 2008-2013*, is currently in progress. The first set of results from this study was published in 2009 and will be discussed in detail; the second part of the study was completed in 2010 and is awaiting publication. The third part of the study was underway at the time this review was completed.

The other available data from sources like the Puerto Rico Department of Education, the U.S. Census, the World Bank and individual authors ranging from researchers like Feliciano (2005) to narrators like Levy and Bahrawi (2005) agree that Puerto Rico is doing quite well regarding the number of students who acquire some sort of education beyond a high school diploma or GED. Total enrollment in post-secondary educational institutions rose to almost 200,000 in 2002-03 from 12,500 students in 1949-50 (Collins 2006). The sharp rise in enrollment rates at various levels of education in Puerto Rico since the late 1940s has led to a remarkable increase in educational attainment among its adult population. The college attendance rate is estimated at over 50% among high school graduates. World Bank data indicate that Puerto Rico has achieved one of the highest college education rates in the world (6th) with 56% of its college-age students attending institutions of higher learning. The actual figures could be higher because a number of students who graduate from island high schools pursue tertiary education outside the island and are not included in statistics about local higher education.

Puerto Rico has an abundance of post-secondary institutions, including traditional public and private universities and many vocational and career training centers. According to the Consejo de Educación Superior, or Puerto Rican Higher Education Council, there are 46 university systems currently operating in Puerto Rico and listed in their June 2010 Directory of Higher Education Institutions. Among these 39 are private and 7 public universities. Many consist of multiple campuses, elevating the total of higher education institutions to 98. This provides a great variety in relation to the island's size and its population.

The Profile of Entering Freshman at Puerto Rican Higher Education Institutions

There have been a few attempts to characterize university students in Puerto Rico. In 2004, *Perfil del Ingresado a las Instituciones de Educación Superior de Puerto Rico, 1996-2002* (Álvarez et al., 2004) concluded that between 1996 and 2002 the average first year post-secondary student in Puerto Rico was approximately 18 years of age, single, a United States' citizen, from a family of 3 to 4 members, predominantly female, and more often a graduate of a public high school, among other characteristics.

Despite the shortcomings of the dataset employed by Álvarez *et al.*, other sources seem to confirm this information, particularly the lower male enrollment. While Álvarez et al. determined that male participation in post-secondary education was between 40.5 and 41.5 between 1996 and 2002, another publication states that in 2002-03 males constituted only 39% of the student body in higher education institutions (Ladd and Rivera-Batiz, 2006). However, the study by Álvarez *et al.* has significant limitations, despite the advantage of using a governmental database that included data reported to the government by every post-secondary institution on the island. It gives the impression of dealing with the entire population of Puerto Rican students enrolled in institutions of higher learning, yet significantly large amount of data are missing. To their credit, the researchers admit that most of the data sets are incomplete and generalizations cannot be made. Furthermore, by definition this study excludes high school graduates who choose to continue studies in the U.S. or abroad, as well as high school graduates who do not enroll. This very limited study seemed to

be the most inclusive and significant recent attempt to describe students enrolled in post-secondary institutions on the island.

Individual universities sometimes also disclose the demographic characteristics of their incoming classes. The Universidad de Puerto Rico (UPR) analyzes the entering freshman profile periodically (López Valentín and Rodríguez Alicea 2000; González and Santiago 2003; Dika 2007; Cruz, Santana and Padilla 2008). Most of the findings are published as institutional reports by the individual campuses, often titled “Perfil del Estudiante de Nuevo Ingreso”, and most can be obtained on paper or online.

Some of the data for these reports was acquired directly from the source, like the high school GPA of entering students (using their December - not graduation - grade reports) and their college entrance examination test scores. For most remaining categories the university relied on student reported data. Yet the existence of these databases can tell us about the kind of students who do enroll in Puerto Rican universities and can be contrasted with our results about high school seniors not interested in higher education. For example, the Universidad de Puerto Rico (UPR) reported that 93.5% of all incoming freshmen were 17 or 18 years of age. 68.5% was female, 98.3% was single and had no children, 46% graduated from public high schools, 73.4 percent will continue to live at home while studying, 12.1% will rent and 6.9% planned to live in student residences. In addition, 29.2% planned to drive to campus every day and almost third (31.5%) planned to use the new urban train or a combination of public transportation involving it. The average GPA for students entering the UPR in 2005 was 3.57 on a 4.0 scale. For 87.6% of respondents, the UPR was their primary choice of institution. Their reasons for choosing UPR included the following: 60% mentioned its academic prestige, tuition cost, and that it facilitates admission to a graduate or professional school as very important. Thirty-four point nine percent gave importance to the fact that it was the only institution on the island offering their particular intended course of study. At the time of enrollment, 25% of incoming students worked at least part-time, and 75% did not work at all.

Current Research by the University Center for Access

A new study, *Proyecto Carvajal para la Democratización del Conocimiento*, or the Carvajal Project for the Democratization of Knowledge, is underway at the *Centro Universitario para el Acceso* (CUA) or University Center for Access, Universidad de Puerto Rico, Recinto de Mayagüez. Its planned scope will cover the years 2008 to 2013. During the first year, Dr. Rima Brusi de Lamadrid and a team of researchers identified and recruited first year students who lived in public housing (residenciales públicos or “caseríos”) in Mayagüez to participate in focus groups. A report about the researchers’ first year findings was made available in late 2009. Additional results from the second year findings are currently in press. First year results confirm the underrepresentation of students from public housing in the island’s most prestigious universities, a higher acceptance ratio from private schools, the importance of peer and family encouragement, and the generally better preparation that the general academic curriculum offers as opposed to the vocational curriculum option. Males continue to be greatly outnumbered, and students often cited teenage pregnancies and the expectation of dependence on government welfare as a demotivating factor among their peers. Among their recommendations to gain a better understanding of the inequalities uncovered, the authors suggested a mixed methods (quantitative and qualitative) study of the “alternate routes”, or the plans and fates of high school graduates who do not pursue higher education.

The follow-up study by Sandra Dika (forthcoming, 2010) included measures of two factors identified in the research literature – socioeconomic indicators and academic preparation – to determine whether these factors are important in the prediction of student persistence. In the first set of analyses, high school GPA and math aptitude were shown to be important predictors of staying in college, as well as the family income and education. The second set of analyses were undertaken to incorporate several social structural variables and determine whether these would result in a more suitable model for predicting retention. The decision to analyze the models separately for men and women was made after examining the first generation and retention differences between these groups.

Contrary to their expectations, the parental income variable (gross income) and the number of family members did not make significant contributions to the prediction of retention for either men or women. However, as already mentioned, official income figures do not reflect the reality of many Puerto Rican households and could lead to inaccurate results. The author mentions that the most interesting result was the differences between the models for men and women, and how family background characteristics may affect them differently at the deciding moment of continuing their education. She reiterates the lack of studies about higher education on the island, and suggests additional research to explore other combinations of the socioeconomic variables, for individuals, schools, and neighborhoods. The author concluded that these results raise questions about how boys and girls are socialized, and whether their educational trajectories and motivations are similar as they aspire to complete a college education. Although this study focused on student persistence at a Puerto Rican university, the predictors of student retention deemed significant in Dika's study were similar to those that showed correlation to enrollment in this research. For example, high school GPA, significant for both males and females in Dika's research, was also significant for postsecondary education in this study.

Dika's analysis uncovered that four factors were statistically significant in the prediction of young men's retention in college: high school GPA ($\chi^2=131.468$, $p<.001$), mathematics aptitude ($\chi^2=5.238$, $p<.05$), Spanish aptitude ($\chi^2=3.67$, $p<.05$) and school type ($\chi^2=3.380$, $p<.05$). The aptitude figures used in her study were the scores from the College Board examination in Puerto Rico. According to her research, young men from private schools are 1.27 times more likely to persist to the second year of studies than those from public schools.

The logistic regression model which the same study ran to predict young women's persistence in college resulted in a slightly different pattern of statistically significant predictors: high school GPA ($\chi^2=74.654$, $p<.001$), parents' marital status ($\chi^2=6.783$, $p<.01$), and school type ($\chi^2=4.860$, $p<.05$). According to Dika (2010), young women whose parents are married are 1.4 times more likely to persist than those whose parents are not married

(1/.705). Finally, young women who attended private school are 1.3 times more likely to continue to second year studies than young women who studied at public schools.

In short, the logistic regression analyses in Dika's study revealed some gender-based differences in academic preparation and socioeconomic factors that predicted retention. Young men's persistence appears to be related to academic preparation (College Board scores, high school GPA), and attending private school, while young women's persistence is also related to high school GPA and private school attendance but also environmental factors like their parents' marital status.

As part of the same project, *Proyecto Carvajal para la Democratización del Conocimiento*, Walter Díaz is currently analyzing Census data from both the 2000 Census and the 2006 Census Population Study in Puerto Rico to uncover if there is correlation between personal characteristics and educational attainment. His research will be included in the same series about access and choice to higher education for which Rima Brusi and Sandra Dika conducted theirs, with results.

The High University Attendance Rate among Puerto Rican High School Graduates

Álvarez *et al.* (2004) and Brusi (2009) commented on statistical data about higher education in Puerto Rico, but other authors have also considered it as part of broader analyses. In their contribution to the book "Economy of Puerto Rico: Restoring Growth", Helen F. Ladd and Francisco Rivera Batiz (2006) agree that college enrollment in Puerto Rico follows an upward trend:

Enrollment data place Puerto Rico in the upper tier of nations ranked by their proportion of college-educated adults. As of 2000, the United States topped the list, with 28 percent of adults aged twenty-five to sixty-four having been awarded a college degree. Puerto Rico's 20.2 percent put it below Norway and the Netherlands but above or tied with all other Organization for Economic Cooperation and Development member nations and well above developing countries with equivalent levels of per capita income. Of interest as well is that our analysis of 2000 Census Bureau data shows the proportion of college graduates in Puerto Rico also exceeded the proportion of Puerto Ricans in the United States with a college degree, which was 13.4 percent

for the population aged twenty-five to sixty-four. (Ladd and Rivera-Batiz, 2006, p.222)

A specific characteristic of recent high school graduates is that in the 2008-2009 academic year an initiative promoted by the University of Puerto Rico was adopted by the Puerto Rican government, who provided \$5.2 million dollars to cover the college entrance exam fee for all public school high school seniors. This was done to broaden the options and facilitate the enrollment of students from a lower socio-economic status. To further increase participation, the exam was offered in a regular school day as opposed to a Saturday, as was previously the norm. The Fall of 2008 registered the highest percentage of college admissions test taking by Puerto Rican high school students by the College Board. 95% of regular curriculum public school students took the exam, as opposed to just 56% the previous year. This opportunity, offered in the Fall of 2008, means that this study was conducted a time that saw a notable increase in college applications from high school students of all kinds. Local newspapers (Rivera Marrero, 2009) have run stories about high school seniors whose outlook and plans for the future changed after taking the exam, receiving a decent score and applying to a university or vocational/professional institute thanks to this initiative.

An important note regarding high school graduates is that while Puerto Rico is the U.S. jurisdiction where a high school graduate is most likely to attend college, high school graduation rates are a different topic. Estimated school dropout rates, although currently declining, are considerably high at 34.4 in 2002-2003 for grades nine (which is still considered “intermediate school” on the island’s public education system) through 12 and, if valid, would constitute a serious problem. However, this indicator is flawed because it only provides one method of classifying students who exit the public school system, which is recorded as a withdrawal (Batiz, 2007; Gracia, 2008). It does not account for the many students who leave the public school system for reasons other than dropping out. Some students migrate from Puerto Rico with their families and subsequently enroll in school on the U.S. mainland or in other countries. Census data indicate that between 1990 and 2000 as many as 103,078 school-age children (which in 1990 represented about 12% of that age population) migrated from Puerto Rico to the continental U.S. Other students leave the public

school system to enroll in private schools, which now educate about 25% of all students on the island.

Another measure, the status dropout rate, can provide a more accurate picture by measuring the percentage of young persons (in this case aged eighteen to twenty-four) past the typical high school completion age who are not enrolled in high school nor have received a high school diploma or GED. In the year 2000, 55.1 of that population did not enroll in school. From those, 33.8 had already completed high school, which leaves us with 21.3 still without a high school credential. This rate is significantly lower than the 40% dropout rate calculated by the public school system's cumulative event measure. Therefore, conclusive figures about the high school dropout rate are not available on the island, which could play a role in the seemingly high tertiary education participation among high school graduates on the island (by eliminating those who would not have gone to college anyway from the totals of high school graduates). Consequently, this prevents a reliable estimate of the high school dropout rate's effect on the college attendance rate among all young adults on the island.

Limitations of the Existing Data Sources

The absence of formal academic studies about access to higher education and choice among Puerto Rican high school graduates is troubling. In addition, there are no studies that analyze students who do not seek higher education and inferences have been made about this population based on the information currently available. Until this point, most studies made assumptions about who goes to college and who does not by analyzing the characteristics of those who do enroll as reported by colleges and universities. For example, the data provided by the UPR suggest that Puerto Rican students prefer to pursue tertiary studies close to their parents' home (2005). This could imply that less motivated students in Corozal, which is not close to a major university campus, may feel discouraged by long commutes or the necessity to move away from home to attend college. But under the same logic we could assume that your chances of attending a UPR campus are slim once you enter the ancient age of 19 or if you are male. This study aimed to prove or disprove the validity of these assumptions as well as the reasoning behind enrollment decisions.

The data collected through this study could also be collected by individual schools, but the reality is that it is currently not being done. Although many students return after graduation to ask for an official copy of their final grade reports (most college applications are processed using only the December grades) in order to enroll at the primary universities, no accurate or central records are kept, and official transcripts are not always required for some vocational or regional colleges (grade reports or diplomas can sometimes work), especially if the student provided a sufficiently good mid-year grade report.

Educational Testing Services releases aggregate data about Puerto Rican students taking the SAT exam. But the sample is too small and biased, as the SAT is only taken by a small number of Puerto Rican students, all attending private schools. The sample is also biased because this examination is, by definition, taken by students who may already be considering enrolling in a United States' university.

Conclusion

As discussed in the preceding paragraphs, the available research on college access and choice is abundant in a global scale but unfortunately has limited applicability to Puerto Rico. The existing body of research paints a clearer picture of enrollment trends in the more studied regions of the globe such as Western Europe and North America (particularly the continental United States and Canada). It also uncovers similarities among the commonly used variables in higher education access, choice and enrollment studies, and even among the relevance of some variables such as parental education levels, which seem to have a widespread effect on a student's decision to continue further studies after high school graduation. At the same time the scarcity of research specific to Puerto Rico and high school graduating seniors underscored the need for additional studies conducted on the island. This study addressed part of the information void that existed about Puerto Rican high school seniors and their possibilities and preferences for pursuing post-secondary studies.

Another purpose served by the literature review was to strengthen the concepts that led to the selection of variables for this study and the reasoning behind the methodology used to analyze them. The next chapter will present and discuss the methodology used in this research.

CHAPTER 3 METHODOLOGY

Introduction

The purpose of this study was to gain a better understanding of the reasons why students in Corozal, Puerto Rico, choose to pursue a university education. The study also explored reasons why some high school graduates do not continue further studies. The decision to include all high school seniors was intended to provide a deeper understanding of the motivations of Corozal's high school students concerning college attendance. The research methodology included both quantitative and a qualitative components. Five research questions were answered with a combination of descriptive statistics, logistic regression analysis and qualitative analysis.

This section begins with an overview and rationale for using the proposed mixed methods research methodology. It then describes the survey component and data collection procedures, including data sources, sites, and participants. The open response analysis will be discussed after the statistical component. Each of the component discussions concludes with a review of the proposed analysis procedures.

Research Design: Overview and Rationale

This study analyzed both quantitative and qualitative data. Both types of data were collected through a survey of high school students in Corozal, Puerto Rico. The first part of the analysis consists of calculating descriptive statistics like the mean and standard deviation for the population of Corozal's high school graduating seniors; for presentation, this data was divided into two groups – those enrolling in a university the following year and those not planning to do so. Descriptive statistics for each group were generated.

The second part of the analysis employed inferential analysis in the form of logistic regression to determine the effect of each independent variable (student characteristics) on the probability of enrolling in tertiary education.

The third and final part of the study examined the open-ended question responses from the students about the reasons why they were applying to the tertiary education programs of their choice, or did not intend to study beyond high school. Another question asked if they wished to study at a later date and if so, what was preventing them from enrolling immediately after graduation. In other words, the purpose of some of the open-ended interview questions was to try to ascertain the reasons which discourage high school seniors from Corozal, Puerto Rico, from attempting post-secondary studies. It should be noted that although the first three research questions divided seniors among those planning to attend a university and those who were not, the fourth and fifth research question addressed the respondents' general study plans for the following year and therefore included a much smaller sample of students not planning to study at all. Most respondents planned to pursue some sort of additional education beyond high school and only 44 had no plans at all. While the students' response to the dependent variable in the quantitative portion of this study could be recoded to include or exclude vocational or short term tertiary education, the open ended questions could not be reformulated.

Qualitative research in the form of open ended questions or interviews is often employed to describe the meanings of central themes in the life world of the subjects (Kvale, 1996). In this case, recurrent themes and their meaning were sought among the participants' decisions not to attend college.

As discussed in the literature review, student enrollment decisions have been interpreted using economic theories as well as sociological factors. In an example of economic theory applied to student enrollment, Linda Seifert writes: "Each institution is a price-discriminating monopolist, and faces a downward sloping demand curve relative to price. All else constant, as the price of attending a specific college decreases, more students will desire enrollment (Seifert, 2002)". But on another approach, social considerations such as

peer or group influence in college plans has been observed and recorded since for over 50 years. In 1964, Ernest Campbell wrote:

“We observed that a student at a given level of parental education is more likely to expect to attend college, to have a strong desire to go to college when he does expect to go, to want to go when he does not expect to go, and actually to get there when he expected to attend, if his best friend does rather than does not plan to go to college. When the student and his friend both plan to go, he is more likely to attend if his friend does” (Campbell, p.568).

However, the unique economic situation of the island and its status as a United States’ Commonwealth, its seemingly contradictory high unemployment and college attendance rates (among high school graduates), and relatively low tertiary education costs make Puerto Rico an particularly interesting but challenging place to conceptualize and conduct these kinds of studies.

To summarize, the purpose for conducting a mixed methods study was to first determine the characteristics and motivation of seniors who do and do not plan to enroll in post-secondary studies and further analyze the motivations of individuals from an understudied group: Puerto Rican high school seniors who do not plan to pursue their education after high school.

Survey Procedures

The survey data was collected by school officials at each of Corozal’s three high schools. The sites and participants at the town’s one private and two public high schools are described in the next section. Student surveys, which were conducted in Spanish, gathered both quantitative and qualitative data. Qualitative data was collected in the form of open-ended written questions for those instances when forcing a choice might seriously limit the type of response. For example, one open-ended question inquired about the reasons why seniors chose to apply for admission to a particular institution. Another asked why some of them are not interested in pursuing further studies.

The survey instrument was piloted in Fall 2008 by 10 high school students and 5 undergraduate university students from Corozal to ensure clarity and face validity. Copies of the questionnaire, which is included in Appendix A, were sent to the Escuela Superior Emilio R. Delgado's Guidance Counselor and two teachers. The feedback received indicated that the survey was clear and the vernacular simple enough to be understood by high school seniors of different abilities and backgrounds, but that perhaps the open ended questions should be reduced to maximize the response rate among the least committed or interested students. As a result, three open ended questions were converted to forced choice items.

Sites and Participants

The questionnaire respondents are the population of high school seniors expected to graduate in May 2010 from high schools in Corozal, PR. Corozal is a middle-sized, mountainous town located in the central mountainous region of the island.

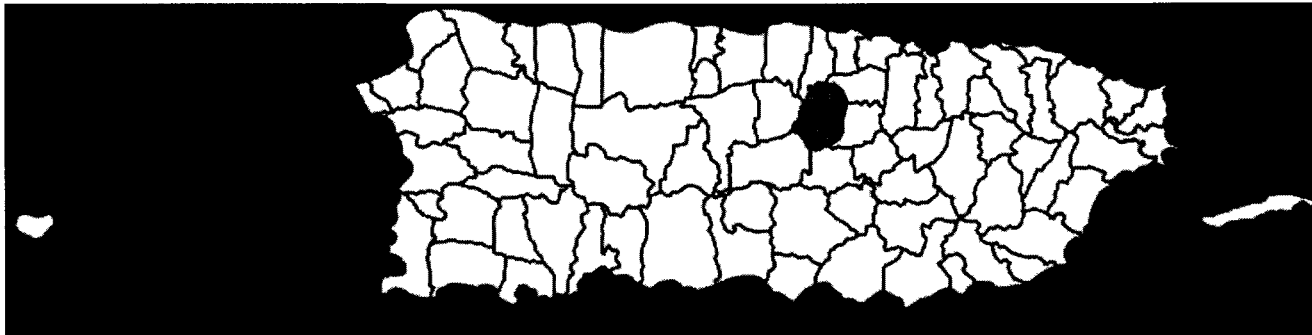


Figure 1: Map of Puerto Rico, with Corozal highlighted.

Corozal has three high schools: A large public school in the urban center of town, a small public school in a remote rural area, and a middle-sized private school affiliated with the Catholic Church, located close to the town's main square. In a town with a population of 36,867 as reported by the 2000 U.S. Census, 396 seniors graduated in May 2009 from the town's three schools. Among them, 231 graduated from the general academic program and the remaining 165 received a vocational high school diploma.

The researcher's interest in this particular town is very personal, as this is the town where she grew up. It is also a convenience sample, since many close relatives worked in Corozal's schools and were in charge of reporting similar data to the central government. The Superintendent approved this study in early 2008, and the Guidance Counselors and administrators of all three high schools enthusiastically agreed to collect the data.

Despite the two year delay and changes in school personnel, school officials were extremely cooperative and expressed interest in the study's results. Their participation, especially the work of the Guidance Counselors and Social Worker, was critical; otherwise the task of collecting these large amounts of data would have been overwhelming, if not impossible.

The Urban Public High School's name is Escuela Superior Emilio R. Delgado. At the beginning of the 2009-2010 academic year 1,225 students were reportedly enrolled in this school. These figures included students in all three grades which constitute a high school in Puerto Rico: 10, 11 and 12. Among these, 709 were enrolled in the general academic program and 516 in the vocational specialization program, again distributed across all three grades. These numbers might have been similar when the survey was conducted at the beginning of the second semester, save for a few who could have moved to another town or state over the holiday break, as the school counselors pointed out. Dividing the total number of students by three (10, 11 and 12th grade) suggests that number of enrolled students in each grade should be slightly over 400. However, the distribution among grades is not equal. In the 2009-2010 academic year the lower grades reportedly had higher enrollment than the higher grades. The questionnaire data was collected during the first week of classes after the holidays (and during the second week at the private school) before enrollment figures had been verified.

The rural public high school is named Escuela Superior Porfirio Cruz García and is located in Barrio Cuchillas at road 568. This school is much smaller than the Escuela Superior Emilio R. Delgado, and generally enrolls between 200 and 250 students in grades 10 through 12.

The Colegio Sagrada Familia is the town's only private high school, located in Barrio Pueblo at road 807. It is run by the Catholic Church and does not offer a vocational career path. Typically about 50 seniors graduated from it each year in past decades, and enrollment has since increased up to the current, largest graduating class of 97 individuals.

Corozal's guidance counselors, including one social worker from the Escuela Porfirio Díaz, administered a survey instrument to graduating seniors in January 2010. Although the survey was voluntary, practically all students chose to participate. While the administration and completion of questionnaires (including a few students who were absent on the designated survey day) was performed by school personnel, the data analysis was performed by the researcher.

The purpose for surveying the entire population of high school seniors was to conduct the most comprehensive study possible and obtain responses from all students who plan, and do not plan to pursue tertiary education. Students not planning to continue post-secondary studies have long been overlooked from studies about access and choice to higher education, especially in Puerto Rico. Their traits, as well as their motivation, hopes and reasons for not studying cannot be assumed to be the opposite, or even much different, from the data about incoming students provided by institutions of higher learning. Moreover, most non-continuing high school seniors do not take College Entrance Examination Board or SAT standardized tests and are not included in most analyses about higher education on the island. Therefore, the questionnaires also sought to learn about this segment – often overlooked - of the student population and add important information to the available body of research about college attendance in Puerto Rico. Corozal's high school senior population, although large, was still a manageable number. Surveying virtually all of them eliminates the need for sampling procedures and minimizes the associated error.

Quantitative Analysis

For the first part of this study, descriptive statistics were used to address the following two research questions:

- What common characteristics do high school seniors planning to enroll in a university share?
- What common characteristics high school seniors *not* planning to attend a university share?

In most situations, these statistics would be followed by validation from a variety of methods, such as the Pearson's chi-square (χ^2) test or the *t*-test. For example, the *t*-test is the most commonly used method to evaluate the differences in means between two groups. However, this step was not necessary because these statistics were validated by the process employed to answer the third research question.

This study also employed inferential analysis to answer the following research question:

- Is there a relationship between demographic characteristics, on the one hand, and students' decisions to pursue university studies, on the other? If so, what variables are associated with this decision?

The inferential technique used to address this last research question – logistic regression analysis--is a statistical method that probes the strength of relationships between variables. This technique was used to determine if there is any relationship between student characteristics, which served as the independent variables in the analysis, and university attendance plans, which served as the dependent variable. As mentioned in the survey's description, the independent variables used included high school type, gender, academic achievement (high school grade point average or GPA), family size, parental education, the family's participation in government assistance programs, involvement in sports, artistic or special talents and an expanded, study-specific definition of "legacy" that included the

students' extended family, a familiar concept in Hispanic culture, as opposed to the traditional U.S. definition that regards only the parents.

Another way to summarize it is that this study sought to determine the odds of a student enrolling in a university after high school graduation according to academic preparedness, socio-economic and demographic characteristics. In mathematical terms, this analysis could be illustrated as: $P(\text{enrollment}) = f(\text{welfare status, legacy, talent, marital status, gender, parental educational, high school type, GPA, ...})$

The most common statistical procedure for estimating most demand functions is linear regression analysis. However, linear regression is not the most appropriate method for this study because the decision to continue studies beyond high school is made only once, and therefore the outcome will be either zero or one. When this is the case, several assumptions of linear regression do not apply. For example, one of the assumptions of linear regression is that the variance of Y is constant across values of X (homoscedasticity); however, this cannot be the case with a binary variable since the variance approaches zero as the distribution of outcomes becomes more extreme (Brannick, 2006).

Another assumption underlying linear regression analysis is that the error term has a normal distribution. But with a binary dependent variable, this is clearly impossible. Robust estimation techniques and the central limit theorem (Greene, 1990) have been proposed as a way to minimize these shortcomings, but there is a more significant limitation that requires the use of another type of regression analysis for this study. Since linear regression assumes a continuous dependent variable, it may predict inadmissible values above one or below zero, which makes no sense since probabilities are bounded between zero and one.

To overcome these methodological limitations, logistic regression allows the prediction of a discrete outcome, such as college attendance, from a set of variables that may be continuous, discrete, dichotomous, or a mix of these. The dependent variable in logistic regression is dichotomous, that is, the dependent variable can take the value 1 with a probability of success p , or the value 0 with probability of failure $(1-p)$. This type of variable is called a binary variable. This study measured a variety of variables including some

dichotomous/categorical variables (like gender and marital status), some continuous variables (College Board test results and family size) and some discrete measures. GPA, which would normally be a continuous variable, was converted to categorical by forcing a choice among GPA ranges in an effort to minimize measurement error among respondents.

Discriminant analysis is another method used to predict the outcome among two possibilities, but it can only be used with continuous independent variables. In contrast, the independent or predictor variables in logistic regression can take any form. Moreover, they do not have to be normally distributed, linearly related or of equal variance within each group. For these reasons, logistic regression is the most appropriate procedure for this part of the study.

The following figure graphically illustrates the difference between the models:

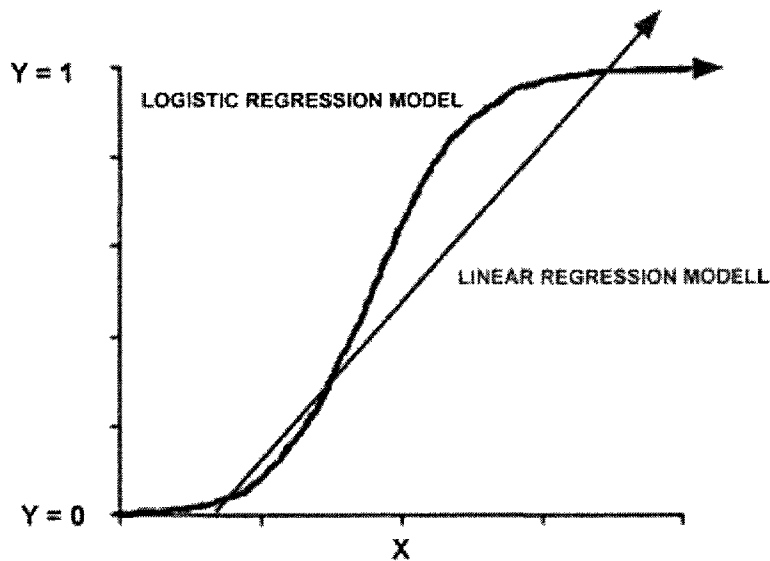


Figure 2: A comparison between the linear and the logistic regression models.

The formula for logistic regression model is:

$$p = \frac{e^{(\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i)}}{1 + e^{(\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i)}} \quad (1)$$

Where α = the constant of the equation and, β = the coefficient of the predictor (independent) variables. e is a mathematical constant: $e = 2.71828$ and its inverse is the natural logarithm, or logarithm to base e .

Now, if we solve (1) for e and take natural log from both sides we get an alternative form of the logistic regression equation:

$$\ln [p/(1-p)] = \alpha + \beta_1x_1 + \beta_2x_2 + \dots + \beta_ix_i \quad (2)$$

The term $\ln [p/(1-p)]$ is the natural log of odds, called *logit [p]* in SPSS. Hence this model is called logit or logistic.

Independent variables. The variables which this study analyzed for their effect on the dependent variable “post-secondary education” are:

- high school type (public rural, public semi-urban, and private)
- gender
- grade point average or GPA
- special talent or skill (the initial reasoning being that it could be worth a scholarship or recruiting efforts)
- student involvement in organized sports
- parental education
- family size
- legacy (if another member of their family ever attended their intended university)
- welfare participation
- marital status
- kids (if they have kids of their own, or are expecting them)
- College Board Examination test scores, but also if they took the exam
- housing type

Income was not used as an independent variable in this study because of the difficulties associated with obtaining a reliable measurement of it, but two survey questions

were included to develop a sense of the family's living standards and if they had any relation to study plans:

- unreported income in the family
- luxury items (if they have at least three of the following in their household: cell phone, Direct TV or cable, or PC)

The variables used mirror those of similar studies, particularly gender, parental education, and high school achievement level. Less commonly used variables, such as the difference in college attendance patterns between private and public and rural and urban high schools have also been found to have an effect in other studies. In summarizing the findings from a 2003 study, Shouping Hu concluded that:

For those students in urban schools who went to college, higher percentages were enrolled in private institutions and four-year colleges. Students in rural schools were consistently disadvantaged in postsecondary aspirations and enrollment, compared to students in other schools. (Hu, 2003, p. 13)

As such, my choice of variables was informed not only by related research conducted in the United States and other countries, but also by my own personal experience in a Puerto Rican high school, during my undergraduate studies on the island, informal interviews with Corozal educators, and the prevalent characteristics of incoming freshmen as reported by Puerto Rican institutions.

Variable coding. Table 4 shows how the variables used in this study were specified and coded; inspection reveals that most of the independent variables were dichotomous, or binary variables.

It should be noted that the survey instrument asked participants to select one of two post-secondary study options: University studies or short-term career courses. These options were intended to provide richer data and possibly make inferences regarding differences among those who do not continue university studies, those who do not but might still pursue

another sort of training, and those who select a traditional university education. But as the study's dependent variable, responses had to be coded as either a complete "yes" or "no" or 1/0, with no ambiguity between those options. Initially, the coding and analysis grouped together all forms of post-secondary studies, but that strategy was abandoned and the dependent variable was recoded to include only university plans.

There were two main problems with coding "UNI/college" to include all forms of post-secondary studies. One is the considerable difference between enrolling in a short career or vocational course lasting anywhere from 75 hours to six months and a regular university education leading to an Associate Degree or higher.

The other is that the number of respondents who plan to do at least some sort of training after high school resulted in an overwhelming majority and therefore unusually large sample of positive responses to the dependent variable "post-secondary studies". Besides producing statistically weaker data, grouping these two groups together would have curtailed the meaning of the study's findings as applicable to the context of traditional higher education.

Table 4
Description and Coding of Variables in the Model

Variable	Description and Coding
UNIColl	Dependent Variable. Intention of enrolling in a university study program 1 if yes; 0 if no
EmilioRDelgado	1 for Escuela Superior Emilio R. Delgado students; 0 for other schools
ColegioSagFam	1 for Colegio Sagrada Familia (private school) students; 0 for others
Esc.PorfirioDiaz	1 for Escuela Porfirio Díaz students; 0 for others
RENTHouse	1 for house renters; 0 for other types of housing
Caserío	1 for public housing complex dwellers; 0 for other types of housing
casapropia	1 for house owning families; 0 for other types of housing
GPAcat	GPA categorical variable. 1 if F, 2 if D, 3 if C, 4 if B, and 5 if A
momedCAT	mother's education: 0 if a high school graduate or less; 1 if she at least attempted to complete a short course
dadedCAT	father's education: 0 if a high school graduate or less; 1 if he has at least attempted a short course afterwards
Gender	0 if male, 1 if female
Marital	0 if unmarried; 1 if married or plans to be in 2010
Kids	0 if none; 1 if the students has children or will in 2010
Famsize	family size; continuous variable
Test	0 if no test was taken (as of Jan. 2010); 1 if yes
Sport	0 for no organized sports participation, 1 for participants
Talent	0 in the absence of artistic talent, 1 for special abilities
Legacy	0 if no one from the family (including the extended family) has gone to the desired institution; 1 if yes
Hrswork	hours worked by household adults; continuous variable
Otherinc	other income, 0 if no one engages in extra or unofficial work (unreported income) or received a pension; 1 if a household member has additional income
Welfare	0 for no welfare participation; 1 for welfare recipients
Lujos	0 for insufficient middle class or above lifestyle indicators, 1 if the household has at least three of: Direct TV, Cable, cell phone, or personal computer.

Omitted variables. Those familiar with similar studies, particularly in the United States, will immediately notice the absence of two variables frequently used in this type of research: family income and race. These variables are among the most widely studied in studies conducted in the United States, and remain a persistent theme in access and choice studies.

Unfortunately, income in Puerto Rico is widely underreported and complex to quantify (Bosworth and Collins, 2006). My reason for excluding family income is because official income figures are unreliable, can lead to misleading results and may distract from the real findings of the study. The survey, however, does include a few items that attempt to create an idea of the economic situation of a family, particularly their discretionary spending, without precisely asking their income.

Therefore, my decision to disregard race in this study may come as a surprise, as it often is an important variable that needs to be included in any serious study that considers demographic factors. But race and ethnicity in Puerto Rico is more complicated to measure and probably less important given the racial mix which every Puerto Rican claims to be a product of. As such, the inclusion of race or ethnicity as a variable in this study will create a lot of noise and most likely will not yield reliable or significant data, since Puerto Ricans often don't even know how to classify themselves when asked race or ethnicity questions.

A study titled "*Residential Segregation on the Island: The Role of Race and Class in Puerto Rican Neighborhoods*" supports these claims. Authors Nancy A. Denton and Jacqueline Villarrubia use figures from the 2000 U.S. Census, in which Puerto Ricans "overwhelmingly chose white as their race, and they chose only one race, not a combination of races that would seem more in keeping with the ideology of mestizaje." The fact that 80% of Puerto Ricans selected "white" as their race contrasts with DNA studies which determined that the predominant genetic contribution of island residents is that of the Taíno Amerindians, accompanied by European and West African in lesser degrees, and would presumably result in incorrectly coded race variables. However, Puerto Rican ethnicity, as a cultural trait and not a racial category, can be assumed for most, if not all, study participants.

Qualitative Analysis

The survey's qualitative component was comprised of three open-ended questions included in the survey instrument. These questions inquired about the students' reasons for pursuing or not pursuing post-secondary studies. The open ended questions are included in the section titled "planes futuros" (future plans) on the questionnaire. The open-ended questions sought to understand:

- Which reasons Puerto Rican students give for their decision to pursue post-secondary studies or not after high school;
- What discourages high school seniors from enrolling in post-secondary institutions; and
- Which factors might influence students' decisions to attend a particular institution or pursue a particular course of study?

There are several benefits to directly asking students to justify their decision to attend college or not in their own words. The most obvious might be that this is the first time that a formal study asks Corozal's high school seniors to do so. In addition, since students are the ones who know their motivations the best, giving them predetermined choices, even if likely answers are researched and carefully chosen, might seriously limit their responses and could result in lost or missing data. In addition, as Robert Donmoyer states, qualitative studies provide us the opportunity to vicariously experience the unique individuals and situations within our culture (Donmoyer, 1990). Therefore, asking students open ended questions about their motivation and thoughts regarding higher education can be expected to produce more accurate and genuine data to better understand the underlying reasons for these decisions.

Student responses to the open-ended questions were reviewed and copied to uncover and identify themes related to the three qualitative research questions. Several categories or patterns emerged from the student data, and they were ranked in a descending order according to their frequency among student responses. The qualitative data analysis involved the

identification of patterns (or “pattern recognition” according to Patton) or recurring themes, categories, and anomalies (Patton, 2002).

The use of the broader category of post-secondary studies or institutions is due to the original language used in the survey instrument, which inquired about “future study plans” and resulted in two different groups: those with concrete study plans of any kind, which were the overwhelming majority, and the smaller sample of 44 students not planning to attend any sort of post-secondary training, school or university.

Conclusion

This chapter described the research methods utilized in this study. A mixed methods research design including quantitative data and open-ended survey questions was deemed appropriate for this study because the research questions guiding it sought to statistically describe the characteristics of a graduating group of high school seniors, the relationship of these characteristics upon their college attendance plans, but also analyzed the reasons for these decisions and for the applicants’ institutional choice. These reasons emerged from the coding of student responses to open-ended written questions.

This research employed an existing dataset which was assembled by school authorities; specifically, the Guidance Counselors and a Social Worker at each one of Corozal’s three high schools handled all aspects of data collection. However, the student questionnaire or survey was designed by the researcher specifically for this study. In the next chapter, the findings of the study are presented.

CHAPTER 4

FINDINGS

The purpose of this chapter is to present the findings of the study; as such, there are three major parts to this chapter: descriptive statistics, inferential analysis results, and student responses to the open-ended questions. First, a profile of the 2010 graduating class in the three schools in Corozal is presented by combining descriptive statistics of graduating seniors from all three Corozal schools. Additional descriptive statistics about students continuing university studies after graduation and those who are not are also presented. Second, the results of the logistic regression analysis are presented along with a discussion of which student characteristics or independent variables were found to be associated with students' university attendance plans. And, third, the qualitative survey responses are summarized to provide insight into the personal motivations and views of Corozal high school seniors pertaining to higher education.

Descriptive Statistics

An Overview of Procedures

This section describes the characteristics of the 2010 graduating class of Corozal from the town's three high schools statistically. Then the section presents descriptive statistics about those who plan and those who do not intend to pursue a university education.

In all cases, means will be used in the statistical descriptions used in this section. The arithmetic mean is the most common measure of central tendency; it is the sum of the variable across all the N observations in a population, or across all n observations in a sample, divided by the number of observations.

To comprehend to what extent a mean might be influenced by extreme cases, the standard deviations – which is the square root of the variance – will be used. The larger the

standard deviation is, the more outliers it represents and, therefore, the greater the potential for the mean to be based on a few (or more) extreme observations. Therefore, a smaller standard deviation may represent more proximity to the mean and a larger standard deviation less.

In this analysis, the variables GPA, College Board scores, hours worked, and family size were measured on a continuous scale. In theory, there are an infinite number of potential attributes for a continuous variable, although GPA and College Board do have limits; for example, GPA is measured on a scale of 1 to 5 and the College Board exam could result in a maximum value of 4,000, which would represent a perfect score.

There were also a fairly large number of binary variables in this study. Because they are coded as 1 if the characteristic is present and 0 otherwise, the sum of the variable – the numerator for the calculation of the mean – is the count of the positive observations for the characteristic. Dividing this count by the total number of observations results in the proportion of observations sharing the trait; thus, the mean of a binary 0/1 variable represents a proportion.

A t-test would normally be performed to compare the means between two independent groups, and would seem appropriate after presenting the results of the first two research questions. However, this step was unnecessary given the logistic regression that followed.

Profile of Corozal's 2010 Graduating Class

Table 5 describes the 2010 graduating class with aggregate data from all three of Corozal's high schools. It also describes the sample used for this study, which consists of 367 students from one large public school, Escuela Emilio R. Delgado, and two smaller schools: The private, Catholic-run Colegio Sagrada Familia, and the Escuela Porfirio Díaz, a rural public school in the southern Barrio Cuchillas. The first three categories on Table 5 represent each one of the three schools and are mutually exclusive. As such, they show the proportion of students attending each school. The next three variables denote residence type and are also mutually exclusive.

Table 5
Descriptive Statistics about the 2010 Senior Graduating class from all three high schools in Corozal, Puerto Rico

Variables Measured	Mean	Standard Deviation
Escuela Emilio R. Delgado	.61	.48
Colegio Sagrada Familia	.23	.42
Escuela Porfirio Díaz	.15	.35
house renters	.11	.31
public housing complex	.03	.17
percentage whose families own their house	.87	.34
Plans to study at a university	.74	.44
grade point average (on a 1 to 5 scale)	3.98	.89
mother's education (anything above HS)	.64	.48
father's education (anything above HS)	.46	.50
married students	.10	.30
gender (1 = female)	.52	.50
having children of their own	.05	.22
family size	4.50	1.32
college entrance test takers	.87	.34
sport participation	.46	.49
artistic talent	.36	.49
legacy (any family member)	.56	.50
hours worked	33.77	22.54
additional income	.67	.47
welfare	.37	.48
luxury items	.88	.33
college entrance exam	2435.21	388.32

There are two items which might seem unusually high when compared to similar figures for North American students. First, an overwhelming majority of Corozal families live in a house they own, and only a small minority rent or live in a subsidized public housing complex. Although homeownership values seem high in comparison to United States' homeownership rates, they reflect the town's agrarian economic past and do not necessarily translate to economic solvency. In addition, the number of family members living under the same roof is also higher, but in Puerto Rican rural towns it is not uncommon that three generations share a residence. This is also evident from the survey data, which asked how many people lived with them but also how many siblings they had. The next figure that might

be surprising to some is that a great majority, or seventy-four percent, of Corozal seniors plans to pursue a university education.

Besides the high percentages of students who claim to live in a house their family owns and those who intend to pursue some sort of studies beyond high school, other figures might be of interest as well. The questionnaire asked the number of hours which adults in the household spend on regular employment every week, but it also asked if there were other sources of income, such as freelance or seasonal (and largely unofficial) work, a home business or a pension or disability income. A considerable majority, sixty-seven percent, claimed to have this sort of unofficial income, which is largely absent - except in the case of pensions or disability payments - from census or government data. The percentage of students who said they had taken the College Board exam before January 2010 was also high at 87%, which is higher than the percentage who plan to enroll in a university. Demographic data such as gender (52% female) is consistent with official school figures reported to the Puerto Rico Department of Education.

Profile of Students from Corozal's 2010 Class who Plan to Pursue University Studies

Table 6 presents aggregate statistics about Corozal 2010 high school seniors who planned to attend a university after graduation.

Perhaps the most dramatic item is the low number of residence renter families whose children plan to attend a university, and the contrast presented by those whose families own the house where they live (92%), who overwhelmingly expressed an intention to attend a university. An even higher percentage, although predictable, was that of students planning to attend a university who have taken the College Board entrance examination. Another high percentage was the maternal educational levels, which is consistent with the global literature.

Stark differences between the university attendance plans among students from all three schools are evident and will be discussed in more detail.

Table 6
Descriptive statistics about Corozal 2010 high school seniors planning to attend a university

variables measured	mean	standard deviation
Escuela Emilio R. Delgado	.60	.49
Colegio Sagrada Familia	.30	.46
Escuela Porfirio Díaz	.10	.30
house renters	.07	.25
public housing complex	.01	.12
percentage whose families own their houses	.92	.27
grade point average (on a 1 to 5 scale)	4.23	.75
mother's education (anything above HS)	.74	.44
father's education (anything above HS)	.53	.50
Gender	.59	.49
married students	.06	.24
having children of their own	.03	.16
family size	4.37	1.26
college entrance test takers	.94	.24
sport participation	.51	.50
artistic talent	.46	.51
legacy (any family member)	.62	.49
hours worked	35.5	22.4
additional income	.65	.48
Welfare	.32	.47
luxury items	.88	.32
college entrance exam	2512.8	502.4

The percentage of students planning to enroll in a university is much higher than the percentage of those who have already decided against it (or cannot for reasons discussed in the qualitative analysis). Therefore there are notable differences between the numbers in the table above and the one describing the next subset of study participants.

Profile of Students Who are *not* Pursuing a University Education

Table 7 presents the descriptive statistics of the ninety-four students who gave a negative answer to the dependent variable, university studies. Once again, decimal figures on binary variables (which exclude GPA, family size, hours worked, and College Board test scores) represent the percentage of respondents in the group.

Table 7

Descriptive Statistics about Corozal high school seniors who are not pursuing university studies

variables measured	mean	standard deviation
Escuela Emilio R. Delgado	.65	.48
Colegio Sagrada Familia	.05	.23
Escuela Porfirio Díaz	.30	.46
house renters	.21	.41
public housing complex	.07	.26
percentage whose families own their houses	.71	.46
grade point average (on a 1 to 5 scale)	3.25	.86
mother's education (anything above HS)	.36	.48
father's education (anything above HS)	.26	.44
gender	.31	.46
married students	.21	.41
having children of their own	.12	.33
family size	4.9	1.43
college entrance test takers	.66	.48
sport participation	.31	.47
artistic talent	.10	.30
legacy (any family member)	.38	.49
hours worked	28.66	22.35
additional income	.72	.45
Welfare	.52	.50
luxury items	.86	.35
college entrance exam	1519.7	791.6

An additional comment about these data needs to be made before discussing the differences between the two groups. The percentage of students who did take the college entrance examination yet do not plan to pursue further study is unusually high; this apparent discrepancy can be explained, at least in part, by the fact that the Puerto Rican government began subsidizing the cost of this exam for public high school seniors in October 2008. It also allowed schools to offer the exam on a regular school day as opposed to Saturdays, which was the only previous option. A 35% increase in the number of test takers was immediately recorded (Rivera Marrero, 2009).

When the data reported in Table 7 are compared to the data in Table 6, several discrepancies are obvious. For example, the mean hours worked by family members living with students not planning to attend college and the College Board exam scores of these students both are lower than comparable data for those who will attend college. The legacy and sports participation ratios are also lower among students not planning to attend college. While none of these variables were significant to university plans in the regression analysis, the contrast among these groups is worth mentioning.

Both groups have similar mean scores related to additional income, welfare, possession of luxury items (such as cell phone or Direct TV), and even family size. Married students appear twice as likely to not continue their studies as unmarried students. Over sixty percent of students planning to continue study after high school reported that at least one family member had attended their preferred institution, while only 38% of students not planning to study have that sort of role models. But the most striking difference is the residence type among the two groups. Students planning to pursue university studies overwhelmingly (92%) live in houses which their family owns.

Logistic Regression Analysis Results

Logistic regression analysis was performed in order to determine which characteristics are more likely to influence the decision to pursue additional studies

among Corozal's 2010 graduating high school class. This section presents the results of this analysis.

Correlation Analysis

The first step of the logistic regression analysis was a correlation analysis on the full list of variables in order to determine which variables were correlated to the decision to seek additional studies among Corozal's graduating seniors. Standard correlation analysis was applied to test the significance of independent variables towards the dependent variable, i.e., the intention to go to college. Table 8 presents the results of the significant variables in the correlation analysis.

Table 8

Correlations table including all significant variables related to university study plans

independent variable	correlation
private school	.25
rural public school	-.24
house renters	-.20
caserío (public housing)	-.15
house ownership	.27
GPA (categorical)	.48
momed (mother's education)	.35
daded (father's education)	.24
gender (feminine)	.25
married	-.22
having kids	-.19
family size	-.17
test taking	.37
sports participation	.17
artistic talent	.32
legacy (all family members)	.21
welfare recipients	-.18

Correlation is significant at the 0.01 level (two-tailed) for all variables

As table 8 reveals, a standard two tailed t – test was used to determine the statistical significance of the correlations between variables. For the purposes of this study, correlations are significant if they pass the $p < .05$ threshold.

The correlation analysis determined that seventeen independent variables passed the significance test towards university study plans. These variables were as follows: Enrollment in the town's private school and the public rural school, all three housing categories (house rental, public subsidized housing or caserío, and house ownership), grade point average (GPAcat), the mother's and father's educational levels (momedCAT and dadedCAT), gender, marital status (married), having (or expecting) kids of their own, taking the College Board Entrance Examination or Puerto Rican version of the SAT (test), participation in organized sports, artistic talent, this study's own version of legacy, and if members of the family are welfare recipients (welfare). All variables were explained in detail in Table 4 (which is found in Chapter 3), Description and Coding of Variables in the Model. A more detailed reproduction of the correlation analysis table including only significant variables is included in Appendix C.

Logistic Regression Results

After determining which variables were significantly correlated with university aspirations, the next step was performing Logistic Regression analysis on the trimmed list of independent variables in order to determine which variables were indicators of the decision to pursue tertiary studies. To arrive at this model, both manual elimination procedures and automatic forward and backward stepwise methods such as likelihood ratio and Wald were tried.

After testing all the significant variables in different combinations, a final model emerged with seven significant variables: The maternal education level, grade point average, family size, private school attendance, self-reported artistic talent and residence in a rented house or public housing complex. This model is presented on Table 9.

Table 9
Significant Variables Which Increased the Likelihood of Pursuing University Studies among Corozal 2010 High School Seniors

<u>independent variable</u>	<u>Coefficient (B)</u>	<u>Significance</u>	<u>Exponent of B</u>	<u>Probability</u>
ColegioSagradaFamilia	2.90	.00	18.22	.94
RENTHouse	-1.58	.00	.21	.17
caserío	-3	.01	.05	.05
GPAcategorical	1.7	.00	5.45	.84
maternal education	1.38	.00	3.95	.79
family size	-.48	.00	.62	.38
artistic talent	1.61	.00	5	.83
constant	-4.26	.00	.01	.01

Pseudo R² values: Cox & Snell R² = .41, Nagelkerke R² = .61

Although R² or the coefficient of determination is used to predict future outcomes in linear regression analysis, this study relied on a different measure because an equivalent statistic to R square does not exist when using logistic regression. The model estimates from a logistic regression are maximum likelihood estimates reached through an iterative process. They are not calculated to minimize variance and therefore the ordinary least squares approach to goodness-of-fit does not apply. However, to evaluate the goodness-of-fit of logistic models, several pseudo R²s have been developed. These are "pseudo" R²s because they are on a similar scale with higher values indicating better model fit, but they cannot be interpreted the same way.

Moreover, there are a number of different pseudo R². For example, in my final model the Cox & Snell R² was .41 and the Nagelkerke R² was .61.

Individual variables in the final model. The significance column in Table 13 indicates that all the variables used at this point were significant at $p < .05$ or less. Our log of odds (formula 2) is:

$$\ln [p/(1-p)] = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i \quad (5)$$

where p is the probability of pursuing postsecondary studies can now be expressed in terms of the variables used in this research. This logistic regression equation became:

$$\ln \left[\frac{p}{1-p} \right] = -4.261 + 2.90 \text{ ColegioSagradaFamilia} + -1.58 \text{ RENThouse} + -3 \text{ caserío} + 1.7 \text{ GPACat} + 1.38 \text{ momedCAT} + -.48 \text{ famsize} + 1.61 \text{ artistic talent} \quad (6)$$

These estimates indicate the relationship between postsecondary studies and the independent variables, where the dependent variable is on the logit scale. These estimates indicate the amount of increase (or decrease, if the sign of the coefficient is negative) in the predicted log odds of going to the university = 1 that would be predicted by a 1 unit increase in the predictor, holding all other predictors constant. Because these coefficients are in log-odds units, they are often difficult to interpret, so they are often converted into odds ratios. These are listed in the column "Exp (B)."

Log of odds of selected significant independent variables. Since the odds ratio is the probability of the event divided by the probability of the event not happening, the ColegioSagradaFamilia dummy variable, for example, can be explained as follows: holding other variables in the model constant, students attending Colegio Sagrada Familia were associated with an increase of 2.9 in the log of odds of going to a university.

The variables for maternal education and artistic talent, momedCAT and othertalent, increase the log of odds of going to a university by 1.36 and 1.61 respectively. The occurrence of the housing variables RENThouse and caserío decreases the log of odds of going to a university by -1.58 and -3 respectively.

Another way of interpreting these results is by calculating the probability of attending a university given the values above. For example, living in a rented house yielded an exponent of $B = .21$. Since $p = \frac{e^{(\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i)}}{1 + e^{(\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i)}}$, then $p_2 = \frac{.21}{1 + .21} = .17$; in other words the probability that someone renting a house would plan to attend a university is 17%.

This means that if a Corozal high school senior lived in a rented house, he would have a .17 probability of going to a university versus a .83 probability of not going, holding all other variables constant.

Similarly, for the variable caserío exponent of $B = .05$, meaning that living in a public housing project results in an approximate $p_3 = \frac{.05}{1 + .05} = .05$ or a 5 % likelihood of studying at a university.

The constant is -4.26, which is the expected value of the log of odds of going to a university when all of the independent variables equal zero. These results assume that other variables are constant, although in practice they may have a cumulative effect on a student's likelihood of attending college.

Notes about the final model. The logistic regression results yielded expected and a few unexpected results. For example, grade point average is a logical predictor for postsecondary enrollment, but residence type was not expected to show such strength. College Board test scores were not significant, although taking the test was correlated to college attendance. A reason that test scores were not significant could have been that the number of students taking this test dramatically increased after the government started subsidizing its cost in the Fall of 2008, and now includes a much larger sample. However, less than half of all survey participants provided their actual score, which is not a representative sample. In addition, some scores appeared to have been rounded up or down, which underscores the possibility of reporting error.

All housing variables were significant in different models: Homeownership, public housing and rented housing. Yet homeownership, which has a positive coefficient and therefore suggests that it increases the likelihood of university studies, was significant in only the forward stepwise methods. Both public housing or “caserío” and “RENThouse” had negative coefficients, meaning that they decrease the likelihood of someone attending college. These two variables were significant in the backwards stepwise models but not in the forward models

Fifty-five cases had missing data and were therefore incomplete and unsuitable for the logistic regression analysis.

Qualitative Analysis Findings

The qualitative portion of this research, which was limited to the analysis of responses to open-ended survey responses, sought to answer the following research questions:

- What motivation do high school seniors report for enrolling in post-secondary institutions?
- What reasons do high school seniors who plan not to enroll in college give for their decision?

In addition, a follow-up question was included in the questionnaire to determine if some of the students not attending college were inclined to do so in the future, and, if so, what specific reasons prevented them from doing so immediately after graduation.

Because the survey questions that corresponded to the research questions listed above were open ended questions, overlap or multiple answers were possible and were accordingly recorded. This resulted in percentages that do not add up to 100 and an apparently larger than average number of answers. Even brief answers, like the four word “es cerca y barata” (it’s

close and cheap) included two or more motivating factors, and it was not uncommon to list several reasons for a given decision.

Before summarizing the qualitative findings, it should be noted once more that the data had to be organized differently here than in the quantitative analysis. Initially, even the quantitative data were disaggregated into two groups: those planning to pursue any type of post-secondary education and those not planning to participate in any additional education. This led to a relatively unproductive analysis, in part, because it did not really get at what the dissertation study was primarily concerned about, i.e., college attendance. It also meant that the number of students in the second category was quite small, which resulted in mostly no statistically significant findings. It then was decided to re-analyze the quantitative data by disaggregating the data into a going-to-universities group and a not-going-to-universities group. Unfortunately, this could not be done with the open-ended response data because of the way the open-ended survey questions were formulated. For example, one question was: What are your reasons for not beginning your studies next year? Another question was: If you plan on studying next year, where are you applying? And yet another asked: Why did you choose to apply to this or these particular institution(s)? Both students planning to enter degree programs and students planning to participate in technical or career education answered these questions.

Reasons for Choosing to Apply to a Particular Institution

The third open-ended question asked students their reasons for choosing the institutions to which they were applying (or planned to apply) for admission. Student responses are presented on Table 10.

Table 10

Reasons listed by Corozal high school seniors for applying to a particular post-secondary institution

reason	number of observations (n)	percentage
Location	171	53
Specific program of study or good career preparation	167	52
Cost	76	24
Prestige or quality	70	22
Personal preferences (campus environment, professionalism of recruiters, etc.)	29	9
Legacy	9	3
Scholarships available	6	2

A total of 323 responses were entered. Although not every student listed his or her reasons for choosing to apply to a particular institution, multiple answers were the norm on this question. A location close to the students' home was a major determinant of the kind of institution to which survey respondents applied. One hundred and seventy-one students listed this reason among the ones that led them to choose a certain institution. In short, the ability to commute and continue living at home strongly influences decisions to apply to institutions within driving distance of Corozal.

However, students from the talented or advanced groups applied to more prestigious and academically rigorous universities, sought more rigorous fields of study and degrees, and were more likely to consider options that would require moving away from home.

Reasons for not Attending College after High School

Table 11 presents the reasons reported by Corozal high school seniors for *not* attempting to continue their studies beyond high school and the percentage of students not planning to attend college who cited a particular reason. These answers were limited to the 44

students who are not planning to participate in any kind of post-secondary education, including short career or technical training courses. Although these two groups were disaggregated in the quantitative analysis reported above, this disaggregation could not occur with the qualitative data due to the way this and the subsequently discussed open-ended survey questions were worded.

Table 11

Reasons given by the forty-four Corozal high school seniors not attempting any kind of post-secondary studies

reason	number	percentage
The need or desire to work	11	24
Having a child to support	7	15
Joining the military	4	9
Tired of school	4	9
Lack of economic incentives	3	7
low GPA	1	2
need to reach adulthood	1	2

Thirty-one reasons for not continuing studies beyond high school were recorded among the 44 students. Although not every respondent chose to provide a particular reason, several listed responses in more than one category. The need to work was cited by eleven students; having a child to support or to care for was an expectation shared by seven students; being fed up with school and joining the military was mentioned by four students each. Three students said they would be better off economically if they stayed home and collected welfare. One student mentioned the desire to become a legal adult (21 on the island) before attending college, and another cited an extremely low GPA.

These comments were grouped in three major thematic categories: Motivational factors, practical considerations, and low perceived returns on their time and effort investment. Below are sample comments written by survey respondents, by category:

Examples of statements reflecting motivational factors. One general category involved comments that alluded to motivational issues. Here are examples of comments that were coded in this way:

- “Because I don’t want to have anything to do with school for a while (Porque no quiero saber de la escuela un tiempito)”
- “I don’t want to study (No quiero estudiar)”
- “Vagabond (vagabundo)”
- “Prefiero ir a University of Life (I prefer to attend the University of Life)”

Examples of statements reflecting practical considerations. As noted, a number of students also cited practical considerations. Here are some sample comments:

- “I have to take Mathematics in the summer because I failed (Tengo que coger matemática en verano porque me colgué)”
- “We’ll see what we can do because I have a child (A ver qué hacemos, porque tengo un hijo)”
- “I want to work and have a car for when I begin my studies (Quiero trabajar y tener un carro para cuando comience mis estudios)”
- “Professional help is needed from school officials in the application process (Hace falta ayuda profesional de la Esc. Emilio para solicitar)”

Examples of statements about low perceived returns from time and effort investment. Finally, a third category of responses involved calculations about the return on investing in a college education. Here are examples of comments that were coded in this way:

- “I have a son and earn more on welfare and doing nails at home (Tengo un hijo y además gano más cojiendo cupones y arreglando uñas en mi casa)”
- “I am joining the ARMY because they pay more than a minimum wage job and offer scholarships later (Me voy al ARMY porque pagan mejor que un trabajo con sueldo mínimo y me ofrecen beca más tarde)”
- “Why study when you have to brown nose or play politics for a job that pays more than \$2000 a month and for less than that it’s better to do odd jobs, get welfare and work under the table. I am joining the military so I can get a sure job and even get paid studies if I want. It’s better to get the heck out of here... (Pa’ qué voy a estudiar si aquí hay que lambar ojo o hacer política pa’ un trabajo que pague más de \$2000 al mes y por menos de eso es mejor hacer chivitos o coger ayudas o trabajar por debajo de la mesa. Yo me voy con el ejército porque así tengo trabajo seguro y hasta me pagan estudios si quiero. Es mejor irse pa’l cara...)”

An additional reason: wanting or having to wait. Among some students who are not going to study the year after graduation, there seems to be interest in returning to education later, as evidenced by the number of “yes” responses to a follow-up question after reporting their plans for the next academic year. The follow-up question was: If you are *not* attending college next year, do plan to start studying later? If yes, what are your reasons for not beginning your studies next year?

Those who indicated they might pursue additional studies were not counted in the quantitative analysis. Besides the problem of the small number of respondents to this question, there also was no way of gauging how serious these long-term plans are. Generally in Puerto Rico, students enter college after high school, although there is a growing minority of students who enter college later. Late bloomers still are not the norm, however. The responses were coded qualitatively, however, and are presented in Table 12.

Table 12

Reasons given by the twenty students (of the original forty-four students) who indicated they might eventually attend college for not attending next year.

reason	number of observations (n)	percentage
The need to work	11	55
Having small children or the need to provide care for a family member	7	35
Joining the military; perhaps using a military scholarship later	4	20
Taking a break from school / doing something different	2	10
waiting for adulthood	1	5

The number of responses to the open-ended question in this area was proportionally higher than generated by other questions. Nearly half of the group that indicated they would not be pursuing post-secondary education indicated that they might want to do so in the future. Table 12 summarizes the reasons given by the twenty students in this group for not attending post-secondary education immediately after high school.

It is possible, of course, that the indication of a desire to attend post-secondary education in the future is a function of peer pressure or some other variable that students were not aware of or did not mention. Once again, not all students elaborated on their personal motivation or reasons, while others listed two or more reasons.

Conclusion

Chapter four presented the findings of this study. According to the statistical data, the decision to pursue university studies among Corozal high school seniors is positively influenced by the mother's educational level, talent, private school attendance, and a higher grade point average. Not owning a residence and larger families exert a negative influence

upon this decision. Among families not owning their home, living in a subsidized public housing complex or “caserío” is twice as detrimental as living in a rented house.

Cost, prestige, personal preferences (like the campus atmosphere) and the availability of a particular field of study were other recurring themes that influenced prospective students’ decisions to seek enrollment.

On the other hand, students not planning to pursue post-secondary studies justified their decisions with motivational factors such as needing a break from school, practical considerations such as the need to work to support their child or other family members, and low perceived returns on the time and effort required to get a college degree.

Students with the highest GPAs and who were taking advanced coursework either at the urban public high school or at the Catholic private school were more likely to travel farther to enroll in what they perceive as the best universities. But for the majority, including average students, enrolling in an institution closer to home was among the most important considerations.

CHAPTER 5

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

Introduction

This study analyzed the responses of virtually all Corozal high school graduating seniors to a questionnaire administered by high school officials. The information gathered included personal and demographic information as well as responses to open ended questions about future plans and motivational factors. The responses first generated descriptive statistics that were later used to inform a series of logistic regression analyses. Open ended responses were analyzed qualitatively. This chapter will briefly review the purpose of the study, as well as the findings that were presented in detail in chapter four. This chapter also contains discussions of the meaning of the findings and the study's implications for policy and future research.

Purpose of the Study

The purpose of this study was to gain a better understanding of the reasons why students in one medium sized town in Puerto Rico, i.e., Corozal, choose to pursue university studies. The study also explored the reasons why some high school graduates do not continue further studies. This attention to high school seniors who do not plan to continue their education after high school is unique in Puerto Rican studies; consequently, this study provided a deeper understanding of the reasons Corozal's high school students might continue tertiary studies or not than the limited number of other studies on this topic found in the literature.

Summary of Findings

The quantitative analysis determined that the most significant predictors of postsecondary studies intention among 2010 high school graduation seniors in Corozal were

GPA, residence type, the maternal educational level, private school attendance, talent and family size. The qualitative analysis determined that motivational factors such as needing a break from school, practical considerations such as the need to work or family obligations, and low perceived returns on time and effort investment were cited by students to justify their decision not to seek further education after high school.

Among students who expected to pursue postsecondary studies, prestige and cost were the primary concerns among applicants with higher GPAs. Among students with lower GPAs, location was the most cited reason. The availability of a specific course of study was another common theme among all students but it was stronger among vocational program students.

Findings about Research Question 1

The first research question was: What are the common characteristics of high school seniors from Corozal, PR, who intend to continue university studies?

Corozal high school seniors who hope to continue studying beyond high school overwhelmingly live in houses owned by their families. In addition, they have higher grade point averages and mothers who at least enrolled and began some kind of studies beyond high school. About half participate in organized sports, and most (94%) had already taken the College Board exam when the data for this study was collected in January 2010. About one third reported welfare recipients in their households, and 59% were female.

Findings about Research Question 2

The second research question was: What are the common characteristics of high school seniors from Corozal, PR, *not* planning to attend a university?

When the descriptive statistics about this group were compared to those from the group pursuing a university education, several differences became apparent. More than half reported welfare recipients in their families, and a greater proportion reported being married, having children of their own, or expecting to be in any of those two categories before the end of the year. Participation in organized sports and artistic talent were also lower for this group.

Other findings were not especially surprising and are consistent with the literature. For example, students not planning to attend a university had lower GPAs (an average of C or lower). Only 31% in this group were female, while 69% were male. The legacy and parental educational levels also were significantly lower for this group than for the college-going group.

Findings about Research Question 3

The third research question guiding this study was: Is there a relationship between student characteristics, on the one hand, and students' decisions to pursue university studies, on the other? If so, what variables are associated with this decision?

Logistic regression analysis was performed in order to determine which variables might influence the students' decisions to attempt further studies beyond high school. First, the correlation analysis determined that residence type, grade point average (GPA), the parents' educational level, gender, school type, marital status, having children, school type, family size, participation in organized sports, talent, legacy, welfare participation and the number of hours worked by adults living in the same household were significantly related to graduating seniors' plans for further studies. Then, logistic regression analysis determined that the positive indicators for university plans among Corozal high school seniors in 2010 were grade point average, studying at a private school, the maternal educational level, and artistic talent. Living in a rented house or public housing, along with larger family sizes, were negative indicators of university aspirations.

Findings about Research Question 4

The fourth research question explored by this study was: What motivation do high school seniors report for enrolling in specific post-secondary institutions?

Overall, the most common reasons listed by the relatively small percentage of students who responded to the open ended questions that were used to generate data to answer this question were cost, prestige, location, and curriculum. Although the study did not initially seek to provide different answers to this question according to the type of institution sought or other student characteristics, several tendencies became apparent during the coding process.

Among students with lower GPA, locational convenience was the most commonly listed reason. Cost, prestige, a specific program of study and personal preferences were also commonly quoted. Among students with higher GPAs, including those taking advanced coursework, cost and prestige were the most important considerations. Prestige, personal preferences and a family member's recommendation were often listed among responses of students attending the private school in Corozal.

Vocational students were more likely to enroll in a short-study program rather than a university degree program. They also were more likely to choose an institution based on the availability of a specific program, like industrial catering.

Findings about Research Question 5

The fifth and last research question was: What reasons do high school seniors who plan not to enroll in post-secondary education give for their decision?

The response rate was lower in part because of the wording of the survey question that was used to answer the fifth research questions. The wording did not focus exclusively on

plans to go to college but rather on plans for any type of post-secondary education. As it turned out, the number of students who were not planning to engage in any kind of post-secondary education was relatively small. Responses from this group of Corozal students can be grouped into three major categories: Motivational factors, practical considerations, and low perceived returns on time and effort investment. Practical considerations such as the need to work, support or take care of a child or family member were cited most often. For example, a few students planned on joining the military, mentioned having a child to support or considered that unofficial or sporadic employment coupled with welfare assistance were more appealing than studying and preparing for a job that may or may not exist.

Discussion

The Statistical Analysis

The statistical findings of this study about high school students in Puerto Rico were in line with conclusions reached by other researchers, particularly in Europe and the Americas, about the characteristics of students with university aspirations and those without, and the factors influencing university attendance. Although the literature review led to the study of variables that have often been found to be correlated to university studies, not every outcome could have been predicted in advance, however. The sharp division between the university bound and non-university bound groups along housing variables was unexpected, although their effect was not. Owning a house could signal not only greater financial prosperity but also a comforting degree of security. On the contrary, renting a residence could indicate more instability, and perhaps less monetary resources. But renting a private residence has a lesser negative influence than living in a public housing project, which may add a negative social environment to other detrimental conditions (and might presumably be linked to poverty, low parental education, and other demographic and motivational factors).

Artistic talent was another unexpected indicator that turned out to be significant. Although the initial reasoning for including the artistic indicator variable along with the sports variable was that both variables could have an effect if a student had been offered a scholarship or actively recruited for sports or artistic talent, only six respondents mentioned “por la beca” (for the scholarship offered) as a motivating factor in selecting a college in the qualitative portion of the study. Consequently, artistic talent could be an indicator of something else, as it is also correlated to smaller family sizes and other significant variables in this study.

Among the findings that are consistent with the literature, the rate of university attendance and especially retention, in studies by Dika (2010) and Brusi de Lamadrid (2008) is higher among private high school graduates. The maternal educational level and grade point average are further indicators for university aspirations. These were expected outcomes based on the prevalent literature and, in the case of GPA, common sense.

On the other hand, a larger family size negatively influences university aspirations. This could be the result of many factors, two of which may be relatively safe to assume: Less individual parental attention (both personal and on the academic side) and fewer resources, since they would have to be shared among a larger number of persons.

Despite the unique characteristics of Corozal, Puerto Rico, this study’s findings are not very different from those of other North American or European studies, which have apparently remained consistent over the past couple of decades. For example, a 1992 study by Hossler and Stage already concluded that parents' expectations and education, student gender, high school GPA, and high school experiences contributed significantly in explaining students' aspirations to attend college.

The Qualitative Component

Among the qualitative portion of the study, the motivational and practical considerations which kept some high school graduates from seeking further education, such as

the need to work, join the military, support or take care of a child or family member, are in line with studies focusing on underprivileged youth in the United States. The remarks from the few students who admitted that unofficial or sporadic employment coupled with welfare assistance were more appealing than studying for a job that may or may not exist might surprise some, but not those with experience on the island, as welfare dependence and its negative effects on the Puerto Rican workforce are a much debated topic.

Reasons for choosing a particular institution. Research question #4 inquired about the reasons for applying to certain institutions. The most recurrent reasons for applying to a specific institution were location, curriculum, cost, and prestige. Recommendations, scholarships, campus atmosphere, and a higher probability of admission were less frequently mentioned.

Location. Location was the most widely cited reason for seeking enrollment in a particular institution. Indeed, a majority of Corozal's seniors applied to institutions located in Bayamón, which is the closest major city to Corozal, located approximately 30 to 45 minutes from the town's two main high schools. In addition, a few students from the rural school reported applying to the Barranquitas campus of the Interamerican University. Barranquitas is a neighbor town located to the south of Corozal but it is farther away than Bayamón for most residents because of the difficulty of navigating the extremely winding roads of Puerto Rico's Central Mountain Range. Students attending the rural high school, which is located precisely in the southern mountainous region of Corozal, might indeed be closer to Barranquitas than to Bayamón, but that is not the case for most of Corozal's inhabitants. Consequently, it is hardly surprising that a smaller number of students indicated that they applied to a university in Barranquitas. A few students also reported a willingness to commute longer distances, as far as Manatí or Guaynabo, which seems less likely but is still possible. Yet a majority of the students with the highest GPA scores and from the advanced programs favored the two main campuses of the Universidad de Puerto Rico (UPR), which are not within driving distance and would require a move to closer accommodations.

Distance from home to the university or college of choice is a variable that generally has not surfaced in most other studies that focused on reasons why students chose a particular institution. Some scholars (Chute, 2006; Pryor et al. 2005; Mattern, Krista, Watt and Jeff, 2009) have explored this variable in other contexts. Their research suggested that the children of less educated or lower income families tend to stay closer to home. The variance in distance traveled to attend college was often related to other variables such as income and educational levels in the family, even race. This study confirms those observations, except for the race variable, excluded from this study for reasons discussed elsewhere in this dissertation.

It should be noted that in the Latin American tradition unmarried adults typically continue to live in their parents' homes, which could help explain at least some of the preference for a closer campus. Undoubtedly, however, proximity also mattered for convenience and comfort, and for cost savings as well.

Curricula. Another major determinant of institutional choice was curriculum or program of study. For example, Criminal Justice, Forensic Psychology, and Industrial Culinary Arts are offered at only a handful of locations, and some students reported applying to them specifically for these programs. A specific curriculum or the availability of a specialization they liked was mentioned by 169 students.

Cost. The price of a university education was another prevalent theme mentioned by 78 students, especially among those seeking admission to one of the UPR campuses, who typically are also higher GPA students. Many students from the academically advanced and higher GPA groups listed multiple universities to which they were applying. Some ranked them in order of preference, and UPR campuses generally occupied the first and second (sometimes even the third) preference spots. The reason frequently given: "Because it's more affordable (porque es más económica)."

Quality and prestige. Prestige and the perceived quality of a university was another common theme. Several applicants to the different University of Puerto Rico (UPR) campuses and a few applying to the private universities Universidad del Sagrado Corazón,

Universidad Interamericana and Universidad Politécnica (which have reputations for being more selective) mentioned this as a decisive factor. A combination of cost and prestige was also a commonly quoted combination among students with higher GPAs, which is explained by the UPR's lower tuition costs.

Family influence. Reasons quoted less often included the possibility of being admitted, the campus atmosphere (a personal preference) and direct family recommendations (which could be related to the statistical variable "legacy"). In this study's broader definition of "legacy," the desire to follow the steps of an older sibling, an influential aunt, uncle or cousins, or even a grandparent, as our only college-bound public housing resident reported, was used, in contrast with the formula traditionally used in the United States, which considers only the students' parents. "Legacy" has no bearing on student admissions on the island's major universities, but it was quoted repeatedly on this study as a positive influence upon college plans.

Scholarships. The smallest category, "scholarships," was mentioned by only six students. Yet these included very different types of respondents, including those heading to prestigious public research institutions, those planning to attend four year private university, and applicants to vocational course. One student applying to a private university specifically mentioned an athletic scholarship he had been offered as his reason for going to that institution.

Summary of findings about respondents' reasons for applying to particular post-secondary institutions. The students' responses about post-secondary institutional choice largely confirm the findings of previous research carried out in North America and abroad, even if Corozal high school students significantly differ from the samples used in other studies.

Among students with lower GPA, convenience, cost and location became the most widely cited consideration when choosing their preferred institution. These were often coupled with a specific program of study, as in the following examples: "Es la más cercana

que ofrece el curso de mecánica que quiero” (It’s the closest that offers the mechanics program I want) or the more general “Porque dan lo que quiero y me queda cerca” (because they offer what I want and it is close). This suggests the necessity or desire to stay at home while studying, although some students with lower grade point averages still wished to be admitted to one of the less selective campuses or programs of study offered by one of the major universities on the island (prestige, collegiate environment, and cost in the case of UPR satellite campuses). This leads to another prevalent theme: Prestige and perceived quality, which together with cost were common themes among students with a higher GPA, from the town’s private school and in one of the homerooms designated as “talented” or with access to advanced coursework.

Observations about vocational program students. Some of the richer responses to the open ended questions were offered by vocational program students. The postsecondary attendance expectations among vocational students in certain specializations such as accounting are surprisingly high, especially considering that vocational programs aim to prepare students to enter the labor marker directly after high school graduation. Although the need for additional studies in order to obtain a job was not expected when the vocational curricula were established, it is evident that this training might sometimes be insufficient in order to secure employment, especially in the 21st Century.

Only the Escuela Superior Emilio R. Delgado offers vocational secondary education in Corozal. Many students from these vocational programs who decided against a university education still hoped to enroll in a shorter career or vocational course. For example, nine classmates from the same homeroom, 12-12¹, which emphasizes electronics and automobile mechanics, expressed a desire to study in Mechtech, a private college offering short vocational programs in mechanics and electronics. Along the same line, five students from the Culinary Arts vocational program, or 12-2, wished to study in the Universidad del Este because it offers a catering and industrial baking short-term vocational program. However,

¹ This designation and similar designations elsewhere in this chapter is a homeroom number.

students in this same group also wanted to attend other private institutions and study unrelated fields like nursing or aviation.

Another vocational group, 12-4, which specializes in Hospitality Industry Administration, had only two students insecure about their plans for the following year because they didn't know what to study or where to enroll. And in group 12-10, which specializes in refrigeration and cabinet making, only three students expressed interest in pursuing additional education.

In contrast, every student from the advanced group (taking advanced placement courses) had concrete plans for attending a four-year university the following August. In group 12-11, which is labeled as "talented," all students planned to pursue a university degree except one girl who preferred beauty school. This trend was mirrored in the private school as well.

Hossler and Maple (1993) suggest that individual decisions about post-secondary enrollment can be broken down into three stages: predisposition, search, and choice. According to their research, students who will ultimately pursue university or college studies can often be differentiated from those who will not as early as the ninth grade based on their predispositions. These predispositions are more drastic in countries where students are steered towards vocational and non-vocational programs of study before they enter high school. Many European countries such as France, Germany and Austria, for example, follow this model, forcing students to choose a vocational or academic education when entering middle school.

This early dichotomizing of students also occurs within Puerto Rican high schools. Generally, students with a vocational education face more difficulties should they later decide to seek university admission (Brusi, 2008). In Europe, the admissions or eligibility requirements often preclude enrollment in higher education by graduates from vocationally oriented secondary schools unless vocational school graduates complete additional studies at an academic school. Although graduates of vocational schools in Puerto Rico are able to

enroll in post-secondary institutions with less complications than their European peers, in 2008 and 2009 vocational school graduates from Puerto Rico told Rima Brusi Gil de Lamadrid and other researchers that the lower academic standards to which they were accustomed in vocational school became a major obstacle to their success when they enrolled at the University of Puerto Rico, Recinto de Mayagüez. (Brusi 2009)

Peer influence or the homeroom effect. Another interesting observation is that students from the same homeroom often applied to similar institutions or programs. This can be partially explained by the fact that “grupo,” which is a similar concept to homeroom in Corozal and means the group of people with whom you take all your classes every day (elective classes are an area which Puerto Rican public schools, particularly rural ones, still have to develop), is determined by ability and program of study. Although homeroom was not analyzed as a variable, tendencies became evident during the coding process. Students from homerooms in the vocational program were much more likely to choose a short program of study or additional vocational training than an academic university program, which raises the question of whether the homeroom effect can be attributed to peer pressure or inherent differences between the vocational and traditional academic curricula and career paths.

Personal Thoughts from the Researcher

A major concern before conducting this study was the students’ seriousness and willingness to express their thoughts openly. While some students occasionally did not answer a particular question and others might have offered inaccurate responses either on purpose or by making inaccurate estimates, I was very pleased with their responsiveness. Some students seemingly could not resist the temptation to act out, as evidenced by a student who wrote “three times a week” after the “sex” (gender) question. Yet he did also choose a gender category and volunteered other sorts of additional information. He identified himself as married with children, said that having a child was his main impediment to pursuing additional studies, wrote-in additional comments next to the cell phone question like “it’s a necessity because we have no other phone”, and added the unsolicited information that while

he does not have Direct TV or cable, he does have other entertainment such as an Xbox 360. A couple of other students also wrote humorous responses. One student who does not intend to attend college listed “Universidad de la Vida”, or the “University of Life,” under the colleges to which he is applying. Another wrote that he plans to be a vagabond for a couple of years. While humorous, these responses might not stray far from what some students are actually thinking.

I expected more missing responses and was surprised both by the respondent rate and by the number of students who chose to provide responses to the open ended questions. Only 13 questionnaires had to be completely excluded from the analysis because of missing responses to the question that represented the dependent variables (i.e., the question about the intent to go to college). Those questionnaires presented many other missing responses as well, which might indicate a hasty or careless approach to filling out the survey. Seven surveys were completely blank on the reverse side of the page. Questionnaires were printed on both sides of a single sheet of paper, with the dependent variable was on the second side.

Some responses to the open ended questions were surprisingly candid. I expected fewer responses to the open ended questions from students who presumably were disengaged or uninterested in school, in general, or in providing answers to questions like the ones posed in this study’s questionnaire, in particular. One way to interpret their high response rate could be that peer pressure to attend college in a small town or high school where everybody else seems to have some sort of plan or general idea about it might place the minority in a defensive stance. In short, they might have already been accustomed or been eager to provide some sort of justification for their decision not to further pursue education beyond high school.

Implications and Recommendations for Further Study

The results of this study, as well as its limitations, suggest several areas in need of further exploration, particularly given the relative lack of related research in Puerto Rico. Among the most pressing topics are variables which showed surprisingly strong results like residence type, and others which might become significant if analyzed differently (legacy) or added to the quantitative analysis (homeroom or vocational versus academic curricula). An expanded qualitative component including personal student interviews with students who are not seeking a university education and replication with samples from different towns are also in order.

Vocational High School Participants and Analyzing Homeroom as a Variable

Although this study's statistical analysis did not include a vocational versus general academic course of study variable for students at the Escuela Emilio R. Delgado, where vocational curricula are available, the original research design contemplated the use of dummy variables to divide and analyze student responses by homeroom. Although this option was not viable, it is evident that students in certain vocational programs are less inclined to apply to a university. However, if the quality of the vocational training that students receive in programs such as cabinet-making is good, their employment and self-employment prospects could also be. Therefore, another suggestion for further study, especially given the almost complete absence of 21st Century skills from the public school curricula and activities, is an analysis of the vocational programs themselves and the employment prospects they offer in a changing global economy.

Legacy: In a Culture of Extended Families, Who Exerts a Stronger Influence?

The variable "legacy," which was among the ones in this study, asked not only *if* a family member had attended their intended educational institution, but also who the family

member was. This question reflects the closeness of the traditional Puerto Rican extended family and the potential for greater influence among a large number of relatives, even supposedly distant ones. Indeed, it was very common to find several choices on the list of relatives who attended the institution the student planned to attend marked on the same form. Interestingly, it appears that older siblings might have almost as much influence as parents in terms of the “legacy” variable, particularly among first generation college-bound students. But while the survey instrument collected this type of data, it wasn’t statistically possible to disaggregate these data to include it in the regression analysis. Therefore, a logical follow-up to this study would be to separate the “legacy” variable into new variables for mother, father, sister, brother, uncle, aunt, cousin, grandfather, and grandmother “legacy” and analyze them independently.

Confirmation of Residence Type as an Indicator

The sharp inequality in educational plans between home owners and renters was both surprising and unexpected. While the challenges faced by youth living in the island’s public housing complexes and their educational implications are well known (Brusi, 2009), the striking contrasts that emerged from the data merit additional attention. Perhaps Corozal or its class of 2010 are anomalies. Perhaps some might have identified their housing type incorrectly. Or the town’s rural location and agrarian heritage, coupled with the past decades’ movement to grant titled land parcels to individuals from lower socioeconomic levels, converted the overwhelming majority of Corozal’s dwellers into homeowners. Owning a house in Corozal could mean a spacious concrete home on a few acres of land but also a humble, sometimes self-built small house, which could have led to a somewhat biased outcome. After all, homeownership rates in Corozal are arguably the highest in the central mountainous region of Puerto Rico. Yet it is telling that all housing variables were indicators of university attendance (although not together in the same model). Further research is needed to determine if results from 2010 were an anomaly or might signal a larger trend.

An Expanded Qualitative Component with Student Interviews

In the qualitative portion of this study, it is evident that the paper questionnaire provided limited data. The survey was impersonal, did not allow dynamic interaction or follow-up questions or the ability to moderate a conversation during which students could gradually open up and share more personal information about their views. An ideal follow-up for this research would be detailed, in-depth interviews with Corozal high school seniors, especially those not planning to pursue tertiary studies.

Replication with a Different Sample

In addition, research utilizing data from other public and private high schools as well as postsecondary institutions in Puerto Rico would be an important next step to understand whether these findings are specific to Corozal or indicative of broader cultural trends within Puerto Rico. In addition, studies should be conducted in other similar rural towns but also in urban centers such as the San Juan metropolitan area.

Implications for Policy

Studies conducted in the United States indicate that the current economy and job market requires an ever increasing proportion of college educated workers (McKinsey, 2009.) Puerto Rico, with a higher population density, resulting intense competition for jobs, and a private sector economy largely dependent on the manufacture of pharmaceutical and high tech items, seems to demand an even higher percentage of educated workers. It is still possible to be financially successful on the island without a postsecondary education. However, in Puerto Rico, as in the United States in general, “the days when a high school diploma sufficed to guarantee a job and a family’s well-being are long over” (Holland, 2009).

While it is unreasonable to expect that every high school graduate should pursue further education, it seems significant that some students cited a desire to study but seem

prevented from doing so by practical considerations such as caring for a family member, and that students not going to college seem to come from a lower socioeconomic status as implied by their family size and residence type. Not continuing their education beyond high school might result in a continuation of the dependence cycle in the families most likely to need a break from it (larger families who do not own their residence) and could complicate efforts to increase productivity on the island. This is especially true in the more remote rural areas where employment is scarce and educational levels lower. For example, at the Escuela Porfirio Diaz, the small rural public high school which is located almost one hour farther from the metropolitan area, 50.9% or 28 respondents are not attending a four year university, compared to 27 students or 49.1% who wish to do so. This is the highest percentage of non-attendance among all three schools. In contrast, the town's only private high school has the highest university attendance rate with 94.2% as opposed to only 5.8% not planning to enroll in a four-year university directly after graduation. This suggests the perpetuation of an economic disparity already in existence. This disparity, documented in Puerto Rico since Spanish colonial times, originated due to forces well beyond the scope of this dissertation.

Puerto Rico, if measured as an independent nation, would be a leader in college attendance among high school graduates, yet there are many reasons why higher education should be further promoted among high school students, especially those from lower socioeconomic levels. Despite the high ratios of high school graduates who seek additional education, Puerto Rico still suffers from the highest official unemployment rate among United States' jurisdictions, and not all individuals out of work are included in official unemployment rates. The real unemployment rate could be much higher, and has been estimated to be as high as 50% (Batiz, 2006). This level of unemployment has serious social implications related to the island's dependence on welfare and its ability to develop a stable economy.

The official unemployment rates for two of Corozal neighboring towns, Orocovis and Morovis, are above 20% and among the highest on the island. Another town, Comerío, although not adjacent is very close to Corozal's southeast and suffers from the highest official unemployment rate on the island, at 26.4%. These towns share similar characteristics with Corozal, including topography, population, and lack of higher education institutions.

While this study identified almost one fourth of all high school seniors as not attempting university studies, only forty-four straightforwardly indicated that they had no plans whatsoever to enroll in any sort of training course, college or university the following year. In fact, almost half of respondents who are not planning to enroll in a university expressed desire to enroll in a short post-secondary training course and might therefore engage in another form of education or training beyond high school.

A way to raise tertiary attendance rates in towns such as Corozal would be to address the issues that this study suggests deter college attendance. For example, having a child negatively affects the opportunities for postsecondary studies or training. Therefore, policymakers might consider funding media campaigns encouraging the postponement of conception and childbirth as a way to reach educational and career goals. Alternately, governmental or even higher education institutions' policymakers could consider funding daycare to encourage young parents to attend a university.

Another tendency among survey respondents was to stay closer to home to attend college, which suggests a need for shorter commutes or better transportation. American University, a private institution with campuses in the nearby cities of Bayamón and Manatí, has recognized this student need and now offers daily transportation from Corozal to its Bayamón campus and back.

These findings underline the well known need for a better public transportation system, contraceptive availability or sexual education and support network for young parents. Yet little progress has been made on the public arena. Public transportation is infrequent and does not follow a reliable schedule. The addition of more reliable options seems unlikely. Puerto Rico's much awaited "tren urbano" (urban train or metro) took decades to complete. The first proposals were made in 1967, and subsequent ones followed up until the eighties. The federal transportation approved the project's financing in 1993 and it was finally inaugurated in December 2004. It does provide service to two of the island's major universities, the University of Puerto Rico's main campus and the Sacred Heart University,

but it only covers a distance of 17.52 km or 10.7 miles. But on the other hand, at least one university recognized this dilemma early on and took action to remedy it. American University, located in Bayamón, led the way in 1998 by establishing a daily bus service to Corozal. Students are picked up in the morning and offered a return trip in the afternoon. This service became very popular, and American University continues to enroll a large number of Corozal students to the present time.

Unfortunately, as is the case elsewhere, many of the predictors of university attendance in Puerto Rico are closely associated with socio-economic indicators. Therefore, this study suggests that the best way to increase university attendance would be to radically change economic policy. This sort of radical change is not likely, however. What might be more likely would be a modification of welfare policy so that welfare is not an incentive for deciding not to attend a university. Alternately, leaders could open dialogue about other more likely options such as tax reform to incentivize work.

Concluding Remarks

Puerto Rico has often been described as a “land of contrasts.” It is second only to Norway in college attendance rates, which could suggest a similar level of economic achievement. Yet Norway has the second largest gross domestic product (GDP) in the world as quoted by several sources including the European Statistical Data Center of the European Commission and the World Bank. Although educational levels have often been linked to productivity and other measures of wealth, Puerto Rico’s per capita income has consistently lagged at around half of that of the poorest state in the USA. When measured independently, Puerto Rico’s income figures rank number 70 in the world while the United States currently is at spot eleven in the United States Central Intelligence Agency’s World Factbook. While it has been widely reported that the island’s underground economy is probably more significant than the official figures, the disparity between apparent education and wealth remains such that the numbers remain incongruous even if per capita income is adjusted upwards to account for part of the underground economic activity.

Supporters of the status quo often point out that Puerto Rico's per capita income ranks above all Latin American countries, but this would be a biased comparison given our status as a U.S. Commonwealth. In contrast, Norway, while having a similar population of 4,768,212 (in 2008) but spread across in a much larger territory, \$87,340 per capita GNI and only two point six percent unemployment according to the World Bank, present a much different reality than Puerto Rico despite the apparent relationship between education and socioeconomic levels.

However, other factors that might play a role and should be mentioned. Foremost is the island's overpopulation, which increases competition for jobs and depresses wages. Puerto Rico is one of the most densely populated areas in the world. Another is the seemingly low persistence rate for university and college students on the island. For example, despite its low cost, the graduation rate at the Universidad de Puerto Rico, Recinto de Mayagüez, is currently 54% (Brusi, 2009). Therefore, the high college enrollment and attendance rates on the island do not necessarily translate to the completion of any certificate or degree. Therefore, if the high school dropout rate is added to the numbers of students who enroll or begin a vocational or university program but do not graduate, the number of adults without a postsecondary degree might eclipse the high percentage of college attendance on the island.

Although Puerto Rico enjoys one of the highest college attendance ratios among high school graduates worldwide, this has not produced the desired effect on the island's economy and employment figures. The underreported income figures on the island could also hide a much larger underground economy and prosperity, but the most likely scenario probably includes a combination of these factors. Persistence rates might also play a role, since college attendance figures do not measure the number of diplomas or certificates awarded and some institutions report graduation rates around 50 percent or lower (Brusi, 2009). But perhaps vocational training or a university degree are not sufficient to guarantee economic prosperity on one of the most densely populated regions in the world. This is apparent in the high percentage of university graduates unable to secure employment after graduation. The need to have family, political party or other personal connections in order to secure certain types of

jobs (in addition to a college education) was mentioned by some survey respondents as a disincentive for post-secondary education.

Determining that the significant predictors for college attendance among Corozal youth were residence type, grade point average, and participation in organized sports, along with the reasons for not continuing further studies offered by respondents, can help administrators better understand their students and advise them accordingly, keeping in mind the obstacles they may face. If further studies confirm these findings, politicians and community leaders can, in turn, address these issues by advocating for those less likely to attend a university and promoting programs that help address their weaknesses.

I hope that this study provides a better understanding of the patterns associated with Corozal students' decisions to attend college and proves useful to educators, administrators and policy makers who wish to improve programs and recruit more students from central towns, but also improve the retention and graduation rates of students from rural communities where no universities are located.

REFERENCES

- Acemoglu, D. and Pischke, J.-S.(2001), "Changes in the wage structure, family income, and children's education," *European Economic Review*, Vol. 45(4-6), p.890-904
- Aleskerov, F., and B. Monjardet. *Utility Maximization, Choice and Preference*. Heidelberg: Springer Verlag, 2002.
- Alexander C.N., Jr. and Campbell, E.Q. (1964), "Peer Influences on Adolescent Educational Aspirations and Attainments" American Sociological Association.
- Álvarez, M., Camacho-Isaac, W., and Figueroa, C.A. (2004). Perfil del Ingresado a las Instituciones de Educación Superior de Puerto Rico: 1996-2002. Consejo de Educación Superior de Puerto Rico. Retrieved online in January 2008 from <http://tendenciaspr.uprrp.edu/Educacion/estudiosdelingresado.pdf>
- Baird, K., (2007), Access to College: The Role of Tuition, Financial Aid, Scholastic Preparation and College Supply in US Public College Enrollments, *Journal of Student Financial Aid*, 36: 3, 16-38.
- Becker, G.S. (1975), Rates of Return on College Education: A Theoretical and Empirical Analysis. National Bureau of Economic Research, p.145-190
- Bedforth, W., Colby, S. and Doctor, J. (2006). Reclaiming the American Dream. The Bridgespan Group.
- Bennett, P.R. and Lutz, A. (2009). "How African American is the Net Black Advantage? Differences in College Attendance Among Immigrant Blacks, Native Blacks, and Whites." *Sociology of Education*, 82: 70-100.
- Berger, J., Motte, A., and Parkin, A. (2009). *The Price of Knowledge: Access and Student Finance in Canada*, Fourth Edition.

- Bloom, J. (2008). The pedagogy of college access programs: A critical analysis. (ASHE/Lumina Policy Briefs and Critical Essays No. 5). Ames, IA: Iowa State University.
- Brannick, M.T.(2008). Correlation and Regression, Advanced Topics: Logistic Regression. Published online at the University of South Florida website.
<http://luna.cas.usf.edu/~mbrannic/files/regression/Logistic.html>
- Bontrager, B. (2007) The Brave New World of Strategic Enrollment Management, College & University, Vol. 82, No. 2
- Brusi Gil de Lamadrid, R. (2009) Si te dejas llevar...Universidad, Geografía y Desigualdad. Primer Cuaderno de Trabajo, Fundación Francisco Carvajal. Mayagüez, PR: Center for University Access (CUA).
- California Postsecondary Education Commission (2005). "Are They Going? University Enrollment and Eligibility for African Americans and Latinos."
- Central Intelligence Agency (2010). Country Comparison: GDP - Per Capita (PPP). The World Factbook. Retrieved online in March 2010 from:
<https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html>
- Centro de Investigaciones Comerciales e Iniciativas Académicas, UPRRP. (2004). Perfil del ingresado a las instituciones de educación superior en Puerto Rico, 1996-2002. Informe preparado para el Consejo de Educación Superior (CES) de Puerto Rico. Retrieved online from: tendenciaspr.uprrp.edu

- Chaudhry, O. (2006). Decision Making - Preference for Post Secondary Institution. Retrieved in August 2009 from <http://searchwarp.com/swa59896.htm>
- Choy, S. P., Horn, L. J., Nuñez, A., & Chen, X. (2000). Transition to college: What helps at-risk students and students whose parents did not attend college. In A. F. Cabrera & S. M. La Nasa (Eds.), *Understanding the college choice of disadvantaged students* (pp. 45-63). San Francisco, CA: Jossey-Bass.
- Choy, S. P., (2002). "Access & Persistence: Findings from 10 Years of Longitudinal Research on Students," American Council on Education.
- Collins, S. M., Bosworth, B. P., & Soto-Class, Miguel, editors (2006). The Brookings Center for the New Economy, *The Economy of Puerto Rico: restoring growth*. Washington, DC: Brookings Institution Press.
- Consejo de Educación Superior de Puerto Rico (2010), Directorio de Instituciones de Educación Superior. Available online at:
<http://www.gobierno.pr/NR/ronlyres/0BF4C446-8C55-44DB-9295-8D04016F3CB3/0/DirectorioInstituciones200910.pdf>
- Day, J. (2004) "Enrollment Forecasting", Hardwick Day, Strategic Competitive Advantage for Private Colleges. Retrieved in April 2009 from
<http://www.hardwickday.com/trends/forecasting/default.php>
- Day, J. (1997) "Enrollment Forecasting and Revenue Implications for Private Colleges and Universities", *New Directions for Institutional Research*, Vol. 1997; 93, pp. 51 – 65
- DeWit, H, Jaramillo I.C., Gacel-Ávila J., and Knight, J. (2005). Higher Education in Latin America: The International Dimension. The World Bank. Retrieved in April 2010 from
http://siteresources.worldbank.org/EXTLACREGTOPEducation/Resources/Higher_Ed_in_LAC_Intnal_Dimension.pdf

- Dika, S. L. (forthcoming 2010). Socioeconomic factors and persistence in college: Evidence from the University of Puerto Rico. Third Working Paper, Proyecto Carvajal para la Democratización del Conocimiento. Mayagüez, PR: Center for University Access (CUA).
- Donmoyer, R. (1990). Generalizability and the single-case study. In Elliott W. Eisner & Alan Peshkin (Eds.), *Qualitative inquiry in education: The continuing debate* (pp. 175-200). New York: Teachers College Press.
- Fanta, Hilda (2007). "Prädiktoren von Universitätsstudien in Kärnten, Österreich", Presentation delivered at the "New Developments Across the Board" conference, Alpen-Adria Universität (September 2007).
- Feliciano, C. (2005). "Does Selective Migration Matter? Explaining Ethnic Disparities in Educational Attainment among Immigrants' Children?" *International Migration Review* 39, no. 4: pp.841-71.
- Goddard, A. (1999). Costs thwart broader access, Times Higher Education Supplement, 10/08/99 Issue 1405, p1, 1/3p
- Heller, D. (Ed.) (2001). The states and public higher education policy: Affordability, access, and accountability. Baltimore, MD: Johns Hopkins University Press.
- Holland, N., & Farmer-Hinton, R. (2009). Leave no schools behind: The importance of a college culture in urban public high schools. *The High School Journal*, 92(3), 24:43.
- Holm-Nielsen, L. B., Brunner, J. J., Balán, J., Thorn, K., & Elacqua, G. (2004). Higher Education in Latin America and the Caribbean: Challenges and Prospects. UNESCO. Retrived in November 2009 from: <http://mt.educarchile.cl/MT/jjbrunner>

- Horn, L. and Carroll, D. (1997). "Confronting the Odds: Students At Risk and the Pipeline to Higher Education". National Center for Education Statistics. Retrieved from: <http://nces.ed.gov/pubs98/98094.pdf>
- Hossler, D. and Stage, F. (1992) "Family and High School Experience Influences on the Postsecondary Educational Plans of Ninth-Grade Students". *American Educational Research Journal*. Vol. 29, No. 2 (Summer, 1992), pp. 425-451
- Hu, S. (2003) Educational aspirations and postsecondary access and choice: Students in urban, suburban, and rural schools compared. *Education Policy Analysis Archives*, 11(14). Retrieved October 2009 from <http://epaa.asu.edu/epaa/v11n14/>.
- Kantrowitz, M. (2007), "The Financial Value of a Higher Education", *NASFAA Journal of Student Financial Aid*, Vol. 37 No. 1, p. 19-37.
- King, J. (1993). The Demand for Higher Education in Puerto Rico. *Economics of Education Review*. Vol. 12 Issue 3 September 1993, Pages 257-265
- Kirwan, W. (2008). *Coming to our Senses: Education and the American Future*. The College Board's Commission on Access, Admission and Success in Higher Education.
- Larry, L.L. and Brinkman, P.T. (1988). *The Economic Value of Higher Education*. American Council on Education/Macmillan Series on Higher Education.
- Light, R. (2001). *Making the Most of College: Students Speak Their Minds*". Harvard University Press.
- Martínez Cruzado, J. C. (2002) "The Use of Mitochondrial DNA to Discover Pre-Columbian Migrations to the Caribbean: Results for Puerto Rico and Expectations for the Dominican Republic". *KACIKE: Journal of Caribbean Amerindian History and*

Anthropology. Special Issue, Retrieved on January 25, 2008, from
<http://www.kacike.org/MartinezEnglish.pdf>

- Matos-Díaz, H. (2008). Relación entre admisiones, calidad de los estudiantes, aprovechamiento académico e “inflación de calificaciones”: Evidencia de la Universidad de Puerto Rico en Bayamón. *Revista de Ciencias Sociales*, Vol. 18, pp78-103.
- Maple., S.A. and Stage, F.K. (1991). Influences on the choice of math/science major and gender and ethnicity. *American Educational Research Journal*. Vol 28, p31-60.
- Mattern, K., and Wyatt, J. (2009). Student Choice of College: How Far Do Students Go For An Education? *Journal of College Admission*. Retrieved in October 2009 from
http://findarticles.com/p/articles/mi_qa3955/is_200904/ai_n31666009/
- McKinsey & Company, Social Sector Office. (2009). The economic impact of the achievement gap in America’s schools. Retrieved online in March 2010 from:
http://www.mckinsey.com/App_Media/Images/Page_Images/Offices/SocialSector/PDF/achievement_gap_report.pdf
- Millett, C.(2003) How Undergraduate Loan Debt Affects Application and Enrollment in Graduate or First Professional School. *The Journal of Higher Education* 74.4 (2003) 386-427. Retrieved from:
http://muse.jhu.edu/journals/journal_of_higher_education/v074/74.4millett.html
- Mortenson, T.G. (1995) Postsecondary Education Opportunity. The Mortenson Report on Public Policy Analysis of Opportunity for Postsecondary Education.
- Mortenson, T.G. (1995) Private Correlates of Educational Attainment. *Postsecondary Education Opportunity*, p31-42, 1995
- Mortenson, T.G. (1997) The Mortenson Research Seminar on Public Policy Analysis of Opportunity for Postsecondary Education, *Postsecondary Education Opportunity*, n55-66, 1997

- Mortenson, T.G. (January 2006). Unmet financial need of undergraduate students by state, sector, status and income levels 2003-04. *Postsecondary Education Opportunity*, Jan. 2006, 163.
- Mortenson, T.G. (2007). Bachelor's Degree Attainment by Age 24 by Family Income Quartiles, 1970 to 2005. Oskaloosa, IA: Postsecondary Education Opportunity
- National Center for Educational Statistics (NCES, 2005). Database on postsecondary enrollment projections from 2003 to 2013. Retrieved in October 2009 from: www.nces.ed.gov
- National Center for Education Statistics (NCES). (2007b). Status and Trends in the Education of Racial and Ethnic Minorities. Washington, DC: U.S. Department of Education.
- Patton, M. (2002), *Qualitative research and evaluation methods: Revised edition*. Thousand Oaks, California: Sage Publications
- Paulsen, M. and Jhon, E. (2002). Social Class and College Costs: Examining the Financial Nexus Between College Choice and Persistence. *The Journal of Higher Education*, Vol. 73, No. 2
- Perna, L. (1999). Racial/ethnic group differences in the realization of education plans. Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 24-28, 2000). Retrieved in June 2009 from http://www.aera.net/grantsprogram/abstract_list/Abstracts/Abs-RG-00033004.html
- Perna, L. W. (2000). Differences in the decision to attend college among African Americans, Hispanics, and Whites. *Journal of Higher Education*, 71, 117-141.
- Perry, R. F. and Rumpf, D. L. (1984). Predicting the likelihood of matriculation for college applicants. *Research in Higher Education*. Vol 21, No. 3, p317-328

- Rivera Marrero, M. (2009, January 12). Aumentan en un 35% los examinados por el College. *El Nuevo Día*, p14
- Seifert, L. (2002). Modeling the Effects of Financial Aid on Student Enrollment Decisions: A Quantitative Case Study of a Private Catholic University. University of San Diego
- Siefert, L. and Galloway, F. (2006) "A new look at solving the undergraduate yield problem: The importance of estimating individual price sensitivities". *College and University Journal* Vol 81, p11-17.
- Smith, M. H., Beaulieu, L. J., & Seraphine, A. (1995). Social capital, place of residence, and college attendance. *Rural Sociology*, 60, 363-380.
- St. John, E. P., Asker, E., & Hu, S. (2001). The role of finances in student choice: A review of theory and research. In M. B. Paulsen & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 419-438). New York: Agathon Press, A Division of Algora Publishing.
- Svennebye, Lars (2009). Large differences in GDP and consumption per inhabitant across Europe. GDP per inhabitant, consumption per inhabitant and comparative price levels 2006-2008. *Eurostat: Statistics in Focus*. Retrieved in February 2010 from: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-095/EN/KS-SF-09-095-EN.PDF
- The Erasmus Programme (2010). European Commission on Education and Training. Retrieved from: http://ec.europa.eu/education/lifelong-learning-programme/doc80_en.htm
- Thiessen, V. (2009). "The Pursuit of Postsecondary Education: A Comparison of First Nations, African, Asian, and European Canadian Youth." *Canadian Review of Sociology*, 46(1): 5-37.

- Thomas and Perna: Postsecondary Reward and Opportunity (2004). Higher Education: Handbook of Theory and Research, Volume XIX. Smart, John C., Editor. The Netherlands.
- Trapmann, S., Hell, B., Weigand, S., and Schuler, H. (2007). *Die Validität von Schulnoten zur Vorhersage des Studienerfolgs - eine Metaanalyse*. Zeitschrift für pädagogische Psychologie 21 (2007), Vol. 1, S. 11-27
- United States Department of Education (1998). Archived Information. Retrieved from: <http://www2.ed.gov/offices/OUS/PES/finaid/enroll98.pdf>
- United States Department of Education (2010) "Puerto Rico to Receive More Than \$174 Million in Additional Recovery Funds" press release September 27, 2010. Retrieved in September 2010 from: <http://www.ed.gov/news/press-releases/puerto-rico-receive-more-174-million-additional-recovery-funds>
- United States Department of Labor, Bureau of Labor Statistics (2010). Regional and State Employment and Unemployment Summary March 26, 2010. Retrieved in March 2010 from <http://www.bls.gov/news.release/laus.nr0.htm>
- Universidad de Puerto Rico (2007) "Aumentan las Becas Pell" Oficina del Presidente Press Release. Retrieved in May 2010 from: uprm.edu/.../20071002AumentanBecasPell.pdf
- Vellerand, R.J., Pelletier, L.G., Blais, M.R., Brière, M.N., Senécal, C., and Vallières, E.F. (1992). The Academic Motivation Scale: A Measure of Intrinsic, Extrinsic, and Amotivation in Education. Educational and Psychological Measurement. Vol. 52
- Winkler, G. (1997). Die Rechtspersönlichkeit der Universitäten. Forschungen aus Staat und Recht. Springer Verlag, Wien.

APPENDIX A
SURVEY
CUESTIONARIO

No escribas tu nombre. Queremos mantener la confidencialidad de tus respuestas.

Grupo: 12-_____

DATOS DEMOGRÁFICOS

Sexo: femenino masculino

Tipo de escuela: pública privada

Familia:

¿Eres casado (a) o te piensas casar este año? sí no

¿Eres padre o madre, o estás esperando un hijo? sí no

¿Cuántas personas viven contigo en tu residencia? _____

¿Cuántos hermanos y hermanas tienes? _____

¿Cuántos adultos cuidan a una persona mayor o infante? _____

¿Dónde vives?

residencial público apartamento alquilado apartamento propio
 casa alquilada casa propia

¿Cuál es el nivel de educación más alto logrado por tus padres?

madre: completó escuela elemental intermedia superior

comenzó, pero no completó, cursos cortos o vocacionales

completó un curso corto o vocacional

estudió en la universidad aunque no se graduó

terminó un grado asociado

terminó el bachillerato

terminó la maestría

terminó un doctorado o estudios profesionales (estudios profesionales = dentista,

medicina, leyes)

no sé

padre: completó escuela elemental intermedia superior

comenzó, pero no completó, cursos cortos o vocacionales

completó un curso corto o vocacional

estudió en la universidad aunque no se graduó

terminó un grado asociado

terminó el bachillerato

- terminó la maestría
 terminó un doctorado o estudios profesionales (estudios profesionales = dentista, medicina, leyes)
 no sé

CARACTERÍSTICAS PERSONALES

índice académico: Según tu mejor estimado, hasta el momento tu índice académico está entre aproximadamente

0 - 0.5 (F) 0.6 - 1.4 (D) 1.5 - 1.9 (C) 2.1 - 2.4 (C alta)

2.6 - 2.9 (B) 3 - 3.4 (B alta) 3.5 - 3.7 (A) 3.8 - 4.0 (A alta)

¿Piensas tomar el examen del College Board? sí no

Si ya lo tomaste, puedes incluir tu puntuación aquí _____

Deportes y habilidades: ¿Practicas algún deporte? sí no

¿Eres parte de algún equipo o has participado en alguna competencia durante el pasado año?

sí no

¿Tienes algún talento o habilidad especial que esperas te ayude a lograr admisión o beca para tus estudios (como tocar instrumentos musicales o practicar deportes)? sí, atlética sí, artística no

PLANES FUTUROS DE ESTUDIO

¿Qué planeas hacer el año que viene?

comenzar estudios universitarios

tomar un curso corto

trabajar

todavía no sé

Si no vas a estudiar el año que viene, ¿deseas estudiar más tarde (dentro de algunos años)?

sí no

Si es así, ¿hay alguna razón que no te permita estudiar el año que viene, o simplemente quieres esperar o hacer otra cosa antes de la universidad?

Si piensas estudiar el año que viene, ¿A qué universidades estás solicitando admisión?

¿Qué te llama la atención de estas instituciones? ¿Por qué las elegiste (o te son convenientes)?

¿Algún miembro de tu familia ha asistido a tu primera opción (tu favorita) para estudios universitarios o carrera corta? sí no

¿Quién? tía Mi madre padre hermano hermana tío
 primo / a abuelo abuela ningún familiar, pero sí amigos (as)

Las siguientes preguntas tratan de establecer si la necesidad de encontrar trabajo y mejorar la situación familiar influye o afecta tu decisión de ir a la universidad o no. Aunque esta información sea diferente cada semana, les agradezco que contesten estimando lo mejor que puedan.

EN TU RESIDENCIA

- En una semana promedio o típica,
- ¿Aproximadamente cuántas horas trabajan los adultos que viven en tu hogar?

 - ¿Cuántas personas hacen chivitos de vez en cuando o trabajan en la casa?

 - ¿Cuántas están jubiladas, incapacitadas o reciben pensión?

 - ¿Recibe alguien en tu hogar ayudas gubernamentales como cupones de alimentos, WIC, plan 8, subsidio de agua/luz/teléfono u otras ayudas? sí no
 - ¿Tienes teléfono celular? sí no
 - ¿Hay computadora, satélite o “DirectTV” o cable en tu residencia? sí no

Questionnaire Translation

Do not write your name. Your answers should remain anonymous.

Demographic data

Gender: male female
School Type: public rural, public urban, private rural, private urban.
Family size: Are you married or plan to be later this year? yes no
Do you have children or might you have them before graduating? yes no

How many persons currently live with you in your family residence? _____
How many brothers and sisters do you have? _____

Where do you live?
 public housing rented apartment own apartment (“condo” in the US)
 rented house own house

Parental Education: To the best of your knowledge, what is your parents’ highest education level?

Mother: completed elementary, intermediate, high school
 took vocational courses

- completed vocational courses
- some college
- completed AA
- Bachelor's
- Master's
- doctoral or professional degree
- unknown

Father: completed elementary, intermediate, high school

- took vocational courses
- completed vocational courses
- some college
- completed AA
- Bachelor's
- Master's
- doctoral or professional degree
- unknown

Personal characteristics

GPA. To the best of your knowledge, what is your current GPA?

- 0 - 0.5 (F) 0.6 - 1.5 (D) 1.5 - 2.0 (C) 2.0 - 2.4 (C+)
- 2.6 - 3 (B) 3 - 3.4 (B+) 3.5 - 3.7 (A-) 3.8 - 4.0 (A)

Test SCORE: Do you plan to take, or have you taken, the College Entrance Examination Board standardized test? yes no

If you have already done so and know your score, you can mention it here. _____

Sports and abilities: Do you regularly work out? yes no
Are you on any team or organized sports group? yes no

Do you possess a special talent or ability that could help you obtain admission and perhaps a scholarship? yes, athletic yes, artistic no

University studies and choice

What do you plan to do next year?

- begin university studies
- pursue a vocational career
- enter the labor market
- still undecided

If you are *not* attending college next year, do plan to start studying later?

- yes no

If yes, what are your reasons for not beginning your studies next year?

If you plan on studying next year, to which universities are you applying?

Why do you wish to study at this (or these) institution(s)?

Legacy: Has any member from your family attended your preferred institution?

yes no

Who? My mother father brother sister
 aunt uncle cousin grandfather grandmother
 no relatives, but friends

The following questions attempt to determine if the possibility or need to find work and improve your financial situation might influence your decision to pursue further studies. Even if you answers could vary from one week to another, I appreciate your effort to answer with your best estimate.

In your residence

In a typical or average week,

How many adults hold a regular or stable job? _____
 How many persons work irregularly or in the “informal economy”? _____
 How many persons receive a pension or disability? _____

Does anyone in your household receive government help, like food stamps, WIC, Plan 8, or electricity / water / telephone subsidies? yes no

Do you have a cell phone? yes no

Does your family have a computer, cable or DirectTV? yes no