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Investigating the Hispanic/Latino Male Dropout Phenomenon: Using Logistic Regression and Survival Analysis

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Investigating the Hispanic/Latino Male Dropout Phenomenon:

Using Logistic Regression and Survival Analysis

by

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Dedication

A Mi Madre

Maria Ester

y

Mi Padre

Jose Maria

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Table of Contents

List of Tables

List of Figures

Investigating the Hispanic/Latino Male Dropout Phenomenon:

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ABSTRACT

This dissertation explored the factors associated with dropping out of middle school and high school among Hispanic/Latino male students. Predictor variables investigated were: age, home language, retention history, SES, program of studies, suspensions, and GPA. Data were from a large urban school district in the state of Florida. A sample of 865 Hispanic/Latino male Latino students in the 8th grade in 1995-96 was followed longitudinally every year to the year 2000-01. Survival analysis and logistic regression were used to examine the data.

The research questions were: 1) What is the relation between age, home language, retention history, SES, program of studies, suspensions, and GPA and dropping out of middle and secondary school by Hispanic/Latino males? 2) At what grade levels do the predictor variables begin to affect the male Hispanic/ Latino students' propensity for early school leaving? When are they at greatest risk?

Of the predictor variables included in this research, age, retention history, program of studies, suspension, and GPA, were found to be statistically significant in the students' decision to drop out of school. This research also found that approximately

31% of this Hispanic/Latino male sample dropped out prior to completing their high school education during the 5-year span. Investigating the most hazardous time for dropping out of school, results suggested that for these students it is well into their secondary education, very close to when they would actually graduate, during their junior to senior years. It may be the time close to their eighteenth birthday that lets them legally choose to leave school that triggers this hazardous time period.

Chapter One

Introduction

Concern about the alarmingly high percentage of Hispanic/Latino students who

drop out of high school began to crystallize in the late 1980s. Although the overall

graduation rates from high school for all students have increased while dropout rates have

decreased (United States Department of Education, 2001), the rate for Hispanic/Latino

students dropping out of school has remained the same or increased. Indeed, for this

ethnic group the problem is getting close to epidemic proportions.

An abundance of research information exists regarding education and school

dropout in general, some of which specifically address the Hispanic/Latino population

(Battin-Pearson, Abbott, Hill, Catalano, Hawkins, & Newcomb, 2000). The majority of

dropout research attempts to identify the personal and social characteristics of the

individuals that predict the occasion to drop out. This in turn may be used for identifying

those at risk and possible intervention programs. Among the factors that have been

investigated in relation to dropping out are: academic achievement (Rumberger &

Thomas, 2000); single-parent households (Pong & Dong-Beom, 2000); school transitions

(Reyes, Gillock, Kobus, & Sanchez, 2000); recency of immigration (Driscoll, 1999); and

school and community characteristics (Alspaugh, 1998).

An article, written in the United States military newspaper known as the *Stars and*

Stripes and published in 1989 said it very clearly. The article entitled, *Hispanic dropout*

rate skyrockets to 35.7% reported; The high school dropout rate among the nearly 4 million Hispanic students in the United States rose to 35.7 percent last year, almost triple that of white students and more than double that of blacks, according to a report by the Department of Education (New York Times, p.12). These findings marked the first time the government had conducted a detailed study of high school dropout statistics and compiled and analyzed the data by race, age, sex, and location. The report, mandated by Congress in 1988, continues to be published yearly and as of 2002, the high school dropout rate among young Hispanic/Latinos has now climbed to 38.6% (NCES, 2002, p.13).

Kronick and Hargis (1998) suggested that one possible approach to investigating the problem of dropouts is to look at the characteristics that differentiate dropouts from graduates. Several of the characteristics they deemed critical in examining dropouts were:

1. Academic Ability – Dropouts have been found to have lower IQs than graduates, to be behind in reading and math, and to be lacking in general academic skills.

2. Age – Dropouts tend to be held back in their schooling and to be one or two years older than their peers.

3. Socioeconomic Status – Dropouts tend to be of lower socioeconomic status than graduates.

4. Race – Dropouts tend to come from non-white, rather than white, racial backgrounds.

5. Gender – Males tend to dropout more often than females and for different but possibly related reasons. Males often report dropping out for financial

reasons, either to help out at home or to support a family, while females report

dropping out to start a home or because of pregnancy.

6. Family Background – It is reported that dropouts tend to come from families in which parents are not graduates of high school. It is also reported that homes where mothers create an environment where studying can be done have fewer dropouts than homes where this environment is not created (Kronick & Hargis, 1998).

With these characteristics that differentiate students who dropout of school as compared to those who graduate as background, the present study narrows the focus of the dropout phenomenon to Hispanic/Latino males exclusively. This specificity is designed to help in identifying the factors contributing to the high dropout rates among this group of students.

Statement of the Problem

Data from the Census Bureau indicate that there were 29.2 million Hispanics in the United States, as of June 1, 1997. Between 1990 and 1997, the population growth was 6.6 million for Hispanics, 6.0 million for Whites, 2.8 million for Blacks, and 2.4 million for Asians. Between these same years, the Hispanic population increased 29%, second only to the Asian/Pacific Islander population category increase of 34%. In contrast, the rate of growth for Whites was 3% and for Blacks, 9.5%. Hispanic/ Latinos have now become the largest minority group in the United States (Census Bureau, 2000).

Another way to emphasize the critical nature of this problem is to report the ratio of Latino dropouts to the non-Latino dropout population. Latino students make up 38.6%

of all dropouts although they represent 15.1% of the population overall. Despite changing immigration patterns and the influx of Latinos to the United States, the percentage has remained consistently higher than any other racial group for the entire 29 years of data collection (NCES, 2000). This large percentage of young people faces the prospect of social and economic disadvantages. Losing such high numbers of students produces an uneducated workforce that costs the nation billions of dollars in welfare, unemployment, and lost output (Koshal, Koshal, & Marino, 1995).

Yet another perspective is the high school completion rate. This is the proportion of 18 to 24 year-olds who have a high school diploma or an equivalent credential (e.g., General Education Development credential). NCES (2003) reported that Hispanic/Latino young adults are less likely than Whites and Blacks to complete high school programs. In 2000, 64% of Hispanic/Latino 18 to 24 year-olds had completed secondary schooling, compared to 92% of Whites and 84% of Blacks. Females were more likely to have completed high school reaching 88% compared to about 85% of male students (NCES, 2003, p. 42).

A report by the Department of Education entitled "*The Hispanic Dropout Project: No More Excuses*" (U. S. Department of Education, 1998), revealed that although the school dropout rates of several minorities have fallen over time, the rates for Hispanic students have remained high and in some areas of the country have actually increased (p. 5). Poverty, lack of English skills, lack of parents with knowledge of the education system, and recent immigrant status are some of the factors that may have contributed to the results. One of the authors of the report stated that "Regardless of your position in society, if you are a Hispanic student, you are more likely to drop out of school and not

earn a diploma than if you are a non-Hispanic American in a similar position" (U.S Department of Education, 1998, p.6).

Current population survey data (Census Bureau, 2002) of 14 to 24 year old high school students indicate a total of 27.367 million students. Of these, 3.375 million were dropouts (12.3%). Hispanic/Latino students numbered 4.918 million, in total, 2.707 million female (44%) and 2.211 million (55%) male. The dropouts numbered 1.479 million which translated to 30.1% of the Hispanic/Latino population, a disproportionate 43.8% of the total number of dropouts. A closer look at the Hispanic/Latino dropouts reveals 565,000 were female (38.2%) and 914,000 were male (61.8%). Not only is there a problem in the number of Hispanic/Latino students not completing high school, but the number of male Hispanic/Latino students failing to get a high school education is also of great concern.

Definitions of Hispanic/Latino students differ across research studies as they focus on one or the other of the terms. The operational definition for the present study includes students who through self, parent or guardian reporting were classified as Hispanic/Latino on their school enrollment forms. These include any of the countries in which Spanish or Portuguese is the native language.

The need for research of the Hispanic/Latino dropout rate cannot be overemphasized. There are several critical implications to U.S. society as a result of this rapidly growing problem. Among them are:

1. Approximately one third of all Hispanic/Latino students leave school without graduating with a high school diploma (U.S. Census Bureau, 2000).

2. Hispanics/Latinos have recently become the largest minority group in the

5

United States and by the year 2010 will comprise one of five Americans (U.S. Census Bureau, 2000; OERA, 1993).

3. A large subgroup of the labor force not having a high school education could be a "disaster for the United States" (Hispanic Dropouts, 1995).

These data translate into a larger percentage of Hispanic/Latino youth facing the prospect of social and economic disadvantages. The number of Hispanic/Latino dropouts starting in the middle school grades on through to high school is not shrinking and the attrition rate increases until the end of secondary education. Failure in high school not only affects the individual, but also affects society. Dropping out of high school translates into a lost chance of a college education, lower paying jobs, political apathy, loss of tax revenue, health problems and strain on social services. Limited education results in a person being more likely to suffer from poverty, engage in criminal activity and destructive behavior (McKissack, 1998; Rosenfeld, Richman and Bowen, 1998; Freeman, 1996; Jarjoura, 1996). Hispanic/Latinos are seen as a coming force in U.S. cultural and political life, but their low school completion rates only enhance the thinking that they are missing out on opportunities for economic advancement.

What is it that is causing so many young Hispanic/Latino students to leave school? The High School and Beyond study, which tracked a 1980 cohort of 30,000 high school sophomores over six years, found that socio-economic class was the strongest predictor of who drops out (Barro, 1984; Fernandez, Paulsen, & Hirano-Nakanishi, 1989; Rumberger, 1995). Fernandez et al. (1989) made several observations from their research on Hispanic youth: 1) Hispanic youth are much more likely to drop out of school than non-Hispanic youth, 2) available evidence suggests that intra-Hispanic differential in

youth dropout rates is at least as large as the Hispanic versus the non-Hispanic differential, and 3) although estimates of the Hispanic high school dropout rate vary widely across studies from a low 20% to a high of 40%, even the more conservative estimates tend to be substantially greater than the dropout rates for non-Hispanic Whites. The authors conclude that educational attainment is positively related to career achievement. From a status attainment perspective, high dropout rates among Hispanic/Latino students only serve as a barrier to the opportunities a higher education make possible.

Some school districts are taking up reforms that don't appear to be supported by empirical evidence. For example, despite research that suggests that retention of students at the same grade level for consecutive years "confers no lasting benefit" to students, retention has become a very popular practice (Natriello, 1998, p. 15). Results from National Center of Education Statistics (NCES, 2000) do not back up the assertion that retention helps prevent students from dropping out.

Purpose of the Study

The purpose of this research is to examine the variables associated with dropping out of high school among Hispanic/Latino male students. Hispanics/Latinos are a diverse group of individuals comprised of different cultures and races. Mexicans make up the largest subgroup in the United States and as of 2000 were approximately (66%) of the Hispanic/Latino population. Central and South Americans made up about 15%, Puerto Ricons 9%, Cubans 4%, and about 6% from other countries (designated as "Other") (NCES, 2003).

This investigation will attempt to identify variables that are associated with Hispanic/Latino male students leaving school without obtaining a degree. In addition to examining such predictors, the aspect of time will be investigated to identify "critical moments" or high risk time periods in students' educational lives, specifically as experienced by Hispanic/Latino male students.

In discussing limits of theory and practice in student attrition, Tinto (1982) elaborated on several shortcomings of his own model of student disengagement from education. Although he was interested primarily in higher education, his observations may be used in relation to all levels of education. Of interest to this present research is Tinto's observation that his model, "...fails to highlight the important differences in education careers that mark the experiences of students of different gender, race, and social status backgrounds"(p. 689). What is being advocated here is the development of group-specific models of student disengagement.

In addition to group-specific investigations on dropouts, Tinto also identified the need to take into account the longitudinal character of dropout. He states:

Although this appears to be self-evident in most studies, we have yet to ask to what degree different types of dropout behavior vary over time. Past studies of dropout, with very few exceptions, have taken a quite limited time perspective. Most often they consider only two points in time: the point of entry, and some later time when dropout or persistence is determined (p. 693).

It is these two specific observations by Tinto that are at the core of this present study. Group specificity is the Hispanic/Latino male and this analysis is longitudinal in nature by looking at the educational careers of this sub-group for five years.

This study uses data from a large school district in west central Florida to investigate the Hispanic/Latino male student and the drop out phenomenon.

Research Questions

This study addressed the following questions:

1. What is the relation between age, home language, retention history, free/reduced lunch, program of studies, behavior (disciplinary suspensions), reading achievement, mathematics achievement, and GPA and dropping out of secondary school by Hispanic/Latino males?

2. At what grade levels do the predictor variables begin to affect the male Hispanic/Latino students' propensity for early school leaving? When are they at greatest risk?

In answering these questions, the researcher hopes to address the gaps in understanding how dropout behavior develops. The focus is on a west central Florida school district population because of: (a) the high number of Hispanic/Latinos included, (b) district is also one of the largest school systems in the country and is similar to many other districts, and (c) there is a lack of empirical analysis of this phenomenon at the local level.

Method of Inquiry

Survival analysis will be one of the statistical methods used in this study. The timing of events is at the center of this statistical method, which has mostly been applied in biological and medical research where the event of interest is time to death. In such research, biostatisticians develop hazard models, hence the name survival analysis. It is also known by other names depending on the field of interest. Economists conduct

discrete time series analysis, engineers use failure time analysis, and sociologists call it event history analysis (Ronco, 1994). As Hougaard (2000) explains:

> Survival data concern times to some event. An event is typically defined as a transition from one of a few states to another state. The main emphasis is the timing of this event. It is a standard requirement that at any one time, we observe whether the event has happened at that specific time point. This should be satisfied for all times, until a time of end of observation (censoring)(p.33).

Specifically, this study is exploring how survival analysis can assist in estimating the probabilities of dropping out of school for Hispanic/Latino male students. Willett and Singer (1991) have advocated the use of survival analysis for studying student dropout and teacher attrition. They have also advocated the use of survival analysis for major studies (Willett & Singer, 1994), in particular for use with NCES data. An important aspect of this analysis is that variables in longitudinal data can be examined with regard to change over time.

The first step in survival analysis is to ascertain the survivor function or plot of the probability that a person, in this case a Hispanic/Latino male student, will stay in the group over time, in this case stay in school. Singer and Willett (1991) write that the shape of the function is always about the same, at the beginning everyone is in the group so the survival probability is 1.0. With increased time, some individuals drop out of school and the survival rate declines toward 0.0, although it never actually reaches 0.0 (this would indicate all students had dropped out). Therefore, a plot of the function resembles an accelerating, negative curve (Denson & Schumacker, 1996).

10

The key to survival analysis is the calculation of the hazard rate, which is "an unobserved variable, yet it controls both the occurrence and timing of events and it is the fundamental dependent variable in an event history model" (Allison, 1984, p. 16). More clearly stated, the hazard rate would be the probability of dropout. This is obtained by dividing the number of students who drop out in a year by the number enrolled in that year. For example, if 48 Latino students dropped out of the tenth grade in a given year and there are 233 students enrolled in the 10th grade that year, the hazard rate is 0.20 which tells us that the students who stay in school each subsequent year are 20 percent likely to dropout (Blossfeld, Hamerle, & Mayer, 1989).

Another key component in survival analysis is the risk set or the group of students who are at risk of dropping out over a set period of time. This study will examine the risk of dropping out for the group of students who enrolled in the 8th grade. Naturally, the risk set group decreases over time as some students will dropout. The risk group is at its smallest when the most people have dropped out, or at the last year of the study as the opportunities for dropping out have been maximized. It is here that the hazard function will have spikes if plotted, since a small change has a larger effect when the risk set is smaller.

Censoring is also an important part of survival analysis. In survival analysis, a variable T (time), is typically the time of the occurrence of an event of interest, in this study the event of interest is dropping out. Censoring occurs when observations are lost during the time frame of the study, a five year longitudinal study in this case, or reach the end of the study and the event has not occurred; these observations are considered right-censored. Students who experienced the event and dropped out would be the uncensored

observations. In describing calculations with right censored observations, a standard practice is to use an indicator variable S (status), being 1 if the observation is an event and 0 when it is a censoring. For listing censored data, the symbol + is typically used, so that $t+$ denotes a censoring at time t. In survival analysis, right censoring does not influence model estimation as both uncensored and censored events can be incorporated (Ronco, 1995).

There are several aims in using survival analysis as the inquiry method in this study. One of the major aims will be evaluating the effects of several covariates, in general. A second aim of the analysis will be prediction, in other words, determining the probability of dropping out for a single group or individual, based on information collected before (this can be an overall probability or based on some covariates). Lastly, in approaching dropping-out as a problem that is multi-faceted, combinations of variables will be analyzed rather than analyzing them one at a time. Several models will be tested in considering which is "best" in identifying variables for inclusion in the model (Hougaard, 2000).

Research in education settings has often been criticized for failing to consider the timing of events (Willett & Singer, 1988). With studies of dropout, the timing of the event is crucial. Other criticisms of existing methodologies that can be overcome with survival analysis are exclusion of subgroups, failing to consider censoring and combining incomparable groups of people (Denson & Schumacker, 1996; Willett & Singer, 1991).

Definition of Terms

The following terms are the operational definitions for use throughout this study:

Attrition. Loss of students between the school years of eighth and twelfth grade without attainment of a diploma.

Retention. Students who repeat a grade due to unsatisfactory performance in the school year in which they are enrolled.

Common Core of Data (CCD). The CCD is a program of the U.S. Department of Education's National Center for Education Statistics that provides a comprehensive, annual, national statistical database of information concerning all public elementary and secondary schools (approximately 95,000) and school districts (approximately 17,000). CCD is made up of a set of 5 surveys sent to state education departments. State education agencies compile CCD requested data into prescribed formats and transmit the information to NCES (NCES, 2001).

Censored. An event is censored if the researcher knows neither when the event will occur nor even whether it will happen. All that is known is that at the end of data collection, the event has not yet occurred. Observations do not experience the target event before data collection ends (Allison, 1995).

Right Censoring. An observation on variable *T (the survival time of interest)* is right censored if all you know about *T* is that it is greater than some value *c (a censoring time which is independent of T)* (Allison, 1995).

Random censoring. When observations are terminated for reasons that are not under the control of the investigator (Allison, 1995).

Cumulative Distribution Function (cdf). One way of describing probability distributions; works for all random variables. The cdf of a variable T, denoted by $F(t)$, is a function that tells us the probability that the variable will be less than or equal to any value t that we choose. Thus, $F(t) = \Pr\{T \leq t\}$.

Probability Density Function (pdf). Works with continuous variables, another way of describing their probability distributions. This function is defined as

$f(t) = \dfrac{dF(t)}{dt} \lim_{\Delta t \to 0} = -\dfrac{dS(t)}{dt}$. The pdf is just the derivative or slope of the cdf.

Hazard Function. Works with continuous variables and is another way of describing their probability distributions. The hazard function is defined as

$h(t) = \lim_{\Delta t \to 0} \dfrac{\Pr\{t \leq T < t + \Delta t \mid T \ldots t\}}{\Delta t}$. The aim of the definition is to quantify the instantaneous risk that an event will occur at time t. The proportion of the risk set who experiences the event in that period; are probabilities over time (Allison, 1995).

Discrete-Time Analysis. The value of the hazard function at time t is a probability. It is the probability that a randomly-selected member of the population will dropout in the interval between t and $t+1$, given the member has survived until the beginning of the same interval. Defined as: $h(t) = \text{Prob}\,[$ dropout between t and $t+1 \mid$ survival until t. (hazard is defined differently in discrete and continuous time) (Allison, 1995).

Dropout. All individuals who: (a) were enrolled at any time during the previous year; (b) were not enrolled at the beginning of the current year; (c) have not graduated from high school or completed a state- or district-approved education program; and (d) do not meet any of the following exclusionary conditions: transferred to another public

14

school district, private school, or state- or district-approved education program; temporary absence due to suspension or school-approved education program; or death (NCES, 2001).

Event Dropout Rate (National). Describes the proportion of youths 15 through 24 years who dropped out of grades 10-12 in the 12 months preceding October of the reporting year (NCES, 2001).

Status Dropout Rate (National). Represents the proportion of youths ages 16 through 24 years who are out of school and who have not earned a high school credential (NCES, 2001).

Hispanic/Latino. Students who through self, parent or guardian reporting were classified as Hispanic/Latino on their school enrollment forms. These may include any of the following: Mexicans, Puerto Ricans, Cubans, Dominicans, Spaniards, Portuguese, and people from any of the Central American countries and any of the South American Countries whose native language is Spanish or Portuguese.

Individualized Education Programs (IEP). The number of students with IEPs under the Individuals with Disabilities Education Act (IDEA)-Part B.

Race/Ethnicity. Categories used in the Common Core of Data (CCD) at the time these data were collected, as approved by the federal Office of Management and Budget. They are mutually exclusive.

Survival Analysis. A class of statistical methods for studying the occurrence and timing of events (Allison, 1995).

Survivor Function. The proportion of an initial population that survives through each of several successive time periods; probabilities over time. Defined as

15

$S (t) = \Pr \{ T > t \} = 1 - F (t)$. Gives the probability of surviving beyond t. The survivor function is a "list" of probabilities, one for each of the times of interest and is best displayed graphically (Allison, 1995).

Time-dependent covariates. Time varying explanatory variables that may change in value over the course of observation.

Importance of the Study

An empirical study of Hispanic/Latino male dropouts will assist educators, administrators, and educational policy makers decide which areas need their attention when considering preventive measures. Jarjoura (1996) acknowledged the difficulty in examining the dropout problem by noting in his discussion "This study makes it clear in more than one way that dropouts are hardly a homogeneous group and the consequences of dropping out of school are not one dimensional"(p.249). If this is the case, a longitudinal look at the dropout problem within/among the student population with an interest in ethnicity and gender will be helpful in adding to the knowledge base.

As stated previously, one third of all Hispanic/Latino students leave school without graduating with a high school diploma, resulting in no opportunity of higher education. Since this group has recently become the largest minority in the United States, in addition to being the most rapidly growing population, and by the year 2010 is predicted to comprise one of five Americans (U.S. Census Bureau, 2000; OERA, 1993), it becomes self-serving to society as a whole that this phenomenon be investigated and solutions be found. Education is of particular concern to this expanding population as one third of Hispanic/Latinos are younger than 18 years old. Between 1972 and 2000 the

enrollment of Hispanic/Latino students in public elementary schools increased 157%, compared to 20% for Black students and 10% for White students (NCES, 2003).

Investigating the critical times that students experience dropping out of their education is important to assist teachers in identifying students who are at risk before problems arise. Looking at a specific gender and ethnicity, Hispanic/Latino males, may shed light on possible areas of future focus if differences are found to be of educational significance. In addition to helping educators, this research will contribute to the educational knowledge base and therefore help those involved in policy development of dropout-prevention measures.

Organization of the Study

Chapter 1 introduces the study. Included in this chapter are the statement of the problem, purpose of the study, research questions, method of inquiry, definition of terms, and organization of the study.

Chapter 2 includes a review of literature related to Hispanic/Latino dropout rates and the review of the use of survival analysis in looking at time as an outcome variable and identifying factors that help predict those times that are the highest risk for students terminating their education.

Chapter 3, the methods section, describes the research design, population, sample, instrumentation, procedures, data analysis, and a summary of the study.

Chapter 4 presents the results from the data analysis. Statistical procedures are documented and the statistical findings are presented.

Chapter 5 discusses the study findings and presents conclusions. Implications are reported as well as recommendations for further research.

Chapter Two

Literature Review

This literature review addresses the general background on the Hispanic/Latino dropout phenomenon. Many of the studies can be identified as looking at student-centered, family-background, or school-centered variables. Several have looked at all three types of variables simultaneously. Most data for dropout studies are obtained or approached from four levels. These are the school, district, state, and national levels. Following will be a review of studies that have explored dropouts at these different levels.

Many of the national level studies have used the National Education Longitudinal Study (NELS 88; 1998) data, and dropout information is extrapolated. Also included in these studies are those using the High School and Beyond (HSB; 1980-82) databases, an earlier longitudinal study. At the state level, numerous studies have been done on dropouts and some have explored Hispanic/Latino dropout specifically; those studies are reported and the states from which data were collected identified. Local level investigations are reviewed next and it is at the local level that this investigation will ultimately focus. Local level data combine school level and district level as one category in this current research.

The review continues by introducing survival analysis as a method of inquiry, and reports on studies in education that have utilized this method to investigate educational problems, with time as an important factor to consider in studying dropping out.

As of 2000, Hispanic students made up approximately 15% of school-age children and that will increase to about 25% of the total school-age population by the year 2025. Since 1980, the enrollment of Hispanic students in elementary public schools has increased over 150%, compared to 20% for African Americans and 10% for Whites (United States Department of Education, 2000).

According to the Center for Education Statistics (NCES, 2000) during each of the last 10 years, approximately three million young adults between the ages of 16 and 24 years have either failed to complete high school or have not completed middle school or enrolled in high school. In the year 2000 that number reached 3.8 million, which represents about 11% of young adults in the United States. This figure is fairly consistent with those attained over the previous five years. Even more disturbing is the disproportionate number of Hispanic/Latino students who fail to complete a high school education. Of the three million plus students not completing high school, Hispanic/Latinos comprised a disproportionate 38.6% of the dropout population, whereas they represent only 15.1% of the student population. In contrast, Blacks as an ethnic group make up 14.6% of the student population but are nearly proportionately represented with 17.6% in the number of dropouts. In contrast, those of European ancestry make up 66% of the student population, but account for only about 41.4% of all dropouts (NCES, 2000).

Examining the dropout rates for Hispanic/Latinos reveals an important trend. In 2000, 27.8% of Hispanic young adults in the 16 through 24 age group had failed to complete high school or had failed to enroll in high school. This rate is nearly four times

that of white young adults. Despite changing immigration patterns and the influx of Hispanics to the United States, this number has remained consistently higher than any other racial group for the entire 29 years of NCES data collection (NCES, 2000).

Current dropout rates for the overall population are lower than those reported in the 1970's and 1980's. Although this also holds true for Hispanic/Latino students, this subgroup tends to dropout at a higher rate than the White or Black subgroups. The decreasing number of dropouts in the overall population may be due to the increased emphasis on a formal education in today's economy. With the Hispanic/Latino population now comprising the largest minority in the United States, and expected to grow faster than any other ethnic group, it is extremely important to find solutions to the increasing number of Hispanic/Latino not graduating high school.

A few general observations may serve to help shed some light on the dropout situation. In 1998-98, nine states had dropout rates lower than 4.0%. These were in low to high order: North Dakota, Iowa, Wisconsin, New Jersey, Maine, Connecticut, Massachusetts, Pennsylvania, and Oklahoma. There were two states (Louisiana and Arizona) and the District of Colombia with dropout rates larger than 8.0%. The rest that reported event dropout rates fell somewhere in the middle. Unfortunately, data were not available for many of the states, some of which are of interest in this research due to their large number of Hispanic/Latino students (i.e., Florida, Texas, Colorado, California, and New York). The other states not reporting event dropout rates were North Carolina, South Carolina, Hawaii, Indiana, Kansas, Michigan, New Hampshire, and Washington (NCES, 2000).

20

There are currently few statistics on dropouts collected by states that are comparable. The NCES does collect some data, but not all states are submitting data and NCES recognizes that many states are not collecting data using the same methodology (Winglee, Marker, & Henderson, 2000). These methodological problems encountered with education statistics are causing difficulties in data interpretation.

High school dropout rates naturally carry over to higher education. The U.S. Census of 2000 reported that 29.3% of people between the ages of 25 and 29 years had completed a bachelors degree or higher, while only 8.9% of Hispanics/Latinos had managed the same. Failure at the high school level not only affects the individual, but it also affects society. Dropping out of high school translates into a lost chance of a college education, lower paying jobs, political apathy, loss of tax revenue, health problems and strain on social services (McKissack, 1998; Rosenfeld, Richman, & Bowen, 1998). A recent U.S. Department of Labor study showed that 6.7% of adults with no high school diploma were likely to be unemployed, while only 3.5% of adults with a high school diploma were likely to be unemployed. With a bachelor's degree, only 1.8% of adults were likely to be unemployed (US Dep. of Labor, 1999).

Further, immigration statistics reveal that as of 2000, a reported 16.9 million people had immigrated to the US from Latin America (Census, 2000). Two thirds of these immigrants came from Mexico and other Central American countries, specifically, 11.8 million from Mexico and Central America, 3.1 million from the Caribbean, and 2 million from South America. The number of Latino immigrants is likely to increase, and in turn so is the number of Latino children in American high schools. Such statistics demand that educators and policy makers take a closer look at the demographics and

predictors of those students dropping out of school, as many Latinos are likely to be left behind economically and socially if this trend continues.

Many empirical studies on high school dropout rates among minorities focus overwhelmingly on the same types of factors. These include characteristics of students and their families, such as, socioeconomic status, marital status of parents, education level of parents, immigration status, and number of siblings. Further, many of these studies use the same national longitudinal data sets (e.g., Alspaugh, 1998; Natriello, 1986; Rumberger & Larson, 1998; Rumberger, 1987). This is advantageous on one hand but it also has its downside. On the positive side, these studies have established consistency in dropout patterns across time, but only looking at national data can obscure possible local trends. For instance, high dropout rates among students in Florida could be offset by lower dropout rates in Connecticut.

National Level Studies

In specifically looking at dropout among Hispanic youth using data from the sophomore cohort of the HS& B data, Fernandez, Paulsen, and Hirano-Nakanishi (1989) found that grades were a strong predictor of dropping out. Looking at non-Hispanic whites, Blacks, and Hispanics by gender, this was true for all three groups. White males also demonstrate a significant effect of both marriage and children on dropping out but only marriage was significant for Hispanic males.

So not only is taking on adult responsibilities a detriment for female students while attending school, but the study showed that white males also had a higher propensity to dropout if marriage and/or parenthood was a factor. The authors' also noted that both male and female black and white students who performed better on the

22

achievement test were less likely to drop out than students who performed poorly on the test. For Hispanics, the same pattern was identified but it was only statistically significant for the males.

Fernandez et al. (1989) concluded that their findings pointed to the importance of separating analyses of dropping out by race/ethnicity and gender. They demonstrated some important differences in the processes that lead students to dropout by these subgroups. There was an exception though; decisions of male Hispanics appear to have been more sensitive to family size than for the other groups. No matter what subgroup they were in, scholastic performance and grade delay affected students' decisions to remain in school or dropout. Among males, achievement is a stronger deterrent to dropping out for Hispanics and non-Hispanic Blacks than for non-Hispanic whites. These findings support the thinking that remedies to grade delay and policies designed to improve Hispanic scholastic achievement are likely to produce the biggest rewards.

Exploring race and academic disidentification, Osborne (1997) reported significant findings relating to Hispanics. He wrote, "identification with academics is the extent to which one's self evaluation in a particular area (e.g., academics) affects one's overall self-evaluation (global self-esteem)" (p. 728). Using Steele's (1992) definition of disidentification as the lack of a relationship between academic self-esteem and global self-esteem, the study examined how Hispanics' academic performance and self esteem compare with that of African American and White students. Data were from the National Education Longitudinal Study (NELS) and only those participants who participated in the base year (1988), first follow-up (1990), and second follow-up (1992) were part of the analysis.

The scores for self-esteem were highest among African-Americans across the three time points. Whites remained very stable across time, whereas African-Americans self-esteem increased from eighth to tenth grade, and then decreased by twelfth grade. An interesting trend was that for Hispanics, who showed that although they had the lowest self-esteem at eighth grade, by twelfth grade their self-esteem was higher than whites. But as the self-esteem of these Hispanic students was increasing, their grades were also dropping. The trends illustrate a potential disconnect between academic reality and self-view for these minority groups, and set the stage for the assertion that these trends may reflect disidentification in progress for the two minority groups (Osborne, 1997).

Using the data collected from the National Educational Longitudinal Study (1988-1994) Kramer, (1998) examined dropout causes among race-ethnic and gender groups. The race-ethnicity variable categories used in the study were Asian/Pacific Islander, Hispanic, Black, White, American Indian/Alaskan Native. Factor analysis was used to categorize the 20 items into workable factors. The extracted factors were named: 1) academic problems, 2) family issues, 3) school disciplinary problems, 4) economics, 5) interpersonal psychosocial, and 6) peer influences. Results of the study found that gender differences varied significantly across five of the six factors used in an analysis of variance of group mean factor scores. The interpersonal factor was the only factor not statistically significant. Males cited the academic factor, school discipline, and economics as the main reasons they left school. Females also cited academics problems first and then family factors as their main reason for dropping out.

The recency of immigration seems to be an important factor in the study of high school dropout rates. Driscoll (1999) used National Education Longitudinal Study (NELS) data to examine this relationship. For purposes of this study, first-generation Latinos were identified as those born outside the United States; second-generation Latinos were defined as those born in the United States with one or both parents born elsewhere; and third-generation Latinos were those born in the United States as were both parents. Prior to this study, Rumberger (1995) concluded that second generation Latinos were higher dropout risks than third generation Latinos. Driscoll (1999) also included socioeconomic and other demographic variables as factors affecting dropout rates. She distinguishes between early and late dropouts with early dropout meaning prior to being a second semester sophomore in high school.

Using a set of logistic regression models, Driscoll (1999) determined that first and second generation Latino students who completed two years of high school were less likely to drop out than third generation students who completed two years of high school. This finding remained significant when socioeconomic and family background variables were held constant. Third generation students were more likely to drop out of school at any point compared to first or second generation students. This finding replicates that of Varlede's (1987) study where she found that Mexican students who were born in Mexico were less likely to drop out than Mexican students born in the United States. This result is surprising given that these students had the advantage of learning English at a young age and having parents who were more likely to be fluent English speakers.

Driscoll (1999) suggests that the finding may reflect third generation students' notion that their chances of success are limited given discriminatory practices and cultural beliefs that do not view education as the key to economic success. The author also identifies the importance of previous academic success on high school completion. She suggests that educators should focus on encouraging academic success early on and to work with students who are struggling, without negatively affecting their perceptions of their own abilities.

Using the NELS school effectiveness study data from 1988, Rumberger and Thomas (2000) looked at dropouts as a measure of school performance and investigated the role of student turnover. The authors point out that student turnover has been neglected in the literature, yet a 1993 study found that 75% of children in the US change schools at least once before the age of 18, and 10% moved at least six times (Rumberger & Thomas, 2000, p. 42). Turnover in some schools has been found to be as high as 30% to 40%. Low-achieving students impede the improvement of schools overall performance on standardized tests. Although their low academic performance is not stated as the reason, such students may be dismissed from schools for various other reasons, contributing to high turnover rates. These students are not typically included in dropout statistics, but in reality they probably should be.

Results from Rumberger and Thomas's (2000) study indicate that turnover rates varied more than dropout rates, and much of the variation in both variables could be accounted for by differences in student characteristics. Further, the characteristics of schools, such as high teacher/student ratios, accounted for much of the change in

turnover rates. The authors suggest that changes to school policies and a focus on

retention would decrease the dropout rate and increase academic performance.

Also using NELS:88 data, Rumberger's (1995) multilevel analysis examined the

factors that influence students' decisions to leave school and the factors that influence

rates of dropping out among schools. In the first part of the study, a student-level model

of dropout behavior was developed and tested with logistic regression using only

individual-level variables. In the second part of the study, a hierarchical linear modeling

(HLM) analysis was performed using both student-level and school-level variables.

As part of the student-level, logistic regression analysis, separate regression

estimates were derived for Blacks, Hispanics, and whites. Controlling other variables in

the model, females had significantly higher dropout rates among Blacks and Whites, but

not among Hispanics. Family socioeconomic status was highly predictive of student drop

out, twice as likely to drop out as students from average social class families. At the

student-level, the single most powerful predictor was whether a student was held back in

an earlier grade (Rumberger, 1995).

The effect of single parent households on risk of dropout has been examined

extensively in the literature with many studies establishing a direct link between the two

variables (Pong & Dong-Beom, 2000). There has also been some examination of the

effects of a reduction in income with regard to family structure. There is some debate on

this issue, with one side arguing that low income could result in greater divorce rates and

subsequently cause children to drop out of school, and the other side arguing that divorce

leads to lower income and subsequent dropout. It has been established in other studies

that the income of a divorced wife decreases fairly dramatically after a divorce (Peterson, 1996).

Proposing that income levels drop after divorce and lead to subsequent higher dropout rates for children of divorce, Pong and Dong-Beom (2000) examined student data from the National Education Longitudinal Study (NELS) of 1998 and focused on students whose parents were together at the beginning of eighth grade and then were divorced some time in the following four years. Results indicated that when family structure changed to a mother-headed household, income significantly decreased and risk of dropout was significantly increased. At the same time, a two-parent family structure did not significantly reduce the dropout risk among Latino students. Nonetheless, the dropout rate increased even more for Latino students when family instability occurred. This dropout rate for Latinos was two times more than that for black students, and three times more than that for White or Asian students with the same levels of family instability. Interestingly, when family instability resulted in the addition of stepparents, the rate of Latino dropout increased even further to nearly 30%.

Shu (1988) investigated the determinants of dropping out of high school for several Hispanic subgroups. This study was unique in that it looked at three specific groups: Mexicans, Puerto Ricans, and Cubans, groups that make up a majority of Hispanics usually included in the "Hispanic" category of most educational research of the United States. High School and Beyond (HSB) data were used to develop models to discriminate dropouts from non-dropouts for the national, Hispanic, as single groups, and then a Mexican, Puerto Rican, and Cuban model as three distinct groups.

As the dependent variable, dropout, is dichotomous in nature, discriminant analysis was the statistical procedure used. The independent factors used in the seven discriminant analyses were: student characteristic (i.e., age, sex, high school program, changed schools since grade 5), family background, educational attainment, school related problems, students' aspirations and expectations, students' perception of the school, and out of school work/activities. Those factors deemed most influential were then applied in various models related to the three subgroups.

Shu (1988) in reporting differences in student characteristic variables among dropouts from various groups found about half of the dropouts were male for the national sample compared to approximately 53% male for the Hispanic sub-sample. When it came to age (categorized into 15 or younger, 16, 17, 18 or older), the dropout rates were much higher for the Hispanic subgroups than for the national sample in all but the 17 year olds. It needs to be noted that there was a higher percent of older students (17 years old and older) in the Hispanic sub-samples than in the national sample. The probability of a Hispanic student dropping out was much greater than that of a student in the national sample regardless of age.

In reporting the results of the comprehensive models, comparisons were made for each of the factors among the models. Within the aspirations and expectations factor, the variable "Expected to leave high school" was a very important predictor in all five models. "Age," under student characteristics was an extremely powerful discriminator for all but the Cuban model. Looking at the educational attainment factor, "Grades," existed in all the models but the Cuban model. Shu (1988) reported that the five comprehensive models were quite different from each other. First, the national model

differed from the Hispanic model and the three Hispanic sub-samples differed significantly from each other. Although the Mexican-American model and the Puerto Rican model shared some discriminative variables, the Cuban American model was different from all other models. It was also the least reliable of all models from a predictive point of view.

In summarizing the historical trend of recent dropout studies, Shu (1988) concluded that two manifest characteristics had emerged. The first is that due to computer technological advances which helped in the creation of national databases, a number of models and theories have been put forth on dropping out of school. The second is the awareness of the high dropout rates among Hispanic youth. Unfortunately, few theories on Hispanic dropouts have been developed and even fewer that focus on Hispanic subgroups.

State Level Studies

Griffin (2002) examined the relationship between high school grades and dropping out for Asian, Black, Hispanic, and White students. The approach was to examine students' ability to identify with academics by looking at the factors associated with academic identification. To identify the discrepancy on the importance put on academics among these ethnic groups, two possible explanations were looked at. One was cultural inversion (Ogbu, 1992), which occurs when minority group members behave in a manner not in-line with the dominant culture. The other was stereotype threat (Steele, 1997), which exists when a student's performance could confirm a negative stereotype about their ethnic group, possibly having an effect on academic performance. Griffin hypothesized that, "if either cultural inversion or stereotype threat plays a role in

30

academic disidentification, the Black and Hispanic students, who often face both negative academic stereotypes and peer pressure to adopt anti-academic behaviors, should place less emphasis on academic performance when deciding to leave school than either Asian or White students." (p.75).

Data for the 1990-1991 school year, grades 9 through 12, were provided by the Florida Department of Education. The study looked at a random sample of 75 high schools from 14 school districts. The variables of interest were dropout status, grade point average (GPA), and race. Results showed the dropout rate was highest for Blacks, closely followed by Hispanics, then Whites, and then Asians. Males had a higher dropout rate across each racial group except for Asian students. For racial groups for which a negative stereotype or oppositional subculture (i.e., peer-pressure to resist schooling and academic success) applies, the dropout rate was higher, supporting the disidentification hypothesis (Griffin, 2002).

Shedding some light on the plight of ethnic minority males, Graham, Hudley, and Taylor (1998) examined, in two studies, middle school students' achievement values. The participants in study 1 were all African-Americans. In study 2, a middle school in Los Angeles, California, comprised of an ethnically diverse sample of 401 students, was used. The breakdown was 50% Latino, 30% African American and 20% White although there were small numbers of Asians, Persians, and biracial students included also.

The data for boys nominating other boys as a function of ethnicity and achievement level were quite surprising. Students were asked to nominate classmates who they most admired, respected, and wanted to be like. Latino nominators overwhelmingly valued other Latinos (76%) compared with African Americans (13%)

31

and White males (11%), and low achievers (39%), over average (33%), and high achievers (28%). The most value nominations (35%) were allocated to low-achieving Latinos. The African American males had similar results as the Latino males. The group receiving the most nominations for admired, respected, and someone the nominator wanted to be like was the low-achieving African American boys (27%), compared with average (15%) and high-achieving African American classmates. White nominators valued high achievers (67%) over average (23%) and low achievers (10%). These results clearly show that males of Latino and African American ethnicity are placing a higher value on other intangibles and not on academics in responding to who it is they admired among their fellow classmates (Graham et al., 1998).

Using data from Chicago area schools, Reyes, Gillock, Kobus, and Sanchez (2000) examined how the school transitions of a group of minority youth relate to academic achievement and dropout. Changing schools is a significant life transition for adolescents and can have a lifelong impact. Previous studies have indicated that a single transition results in higher dropout rates (Blyth et al., 1983; Eccles & Midgely, 1988; Seidman et al., 1996). By not relying on national data, this study portrays what school transitions are really like for urban minority youth from low socioeconomic backgrounds, without these experiences getting lost in aggregate data. The study looks at self-reported changes in self-perceptions from eighth to ninth grade, social support networks, perceptions of school and also academic performance.

Reyes et al. (2000) hypothesized that those students who completed school would have had smoother transitions from middle school to high school and also have more positive self-perceptions. Results obtained from a series of multivariate analyses of

32

variance (MANOVA) revealed that fewer transitions lead to higher achievement and therefore, lower dropout rates. Students who experienced fewer transitions from middle to high school also had better academic grades than those students who experienced dramatic changes (either positive or negative). On the whole, minority students were found to be extremely sensitive to school transitions. The authors comment that this sensitivity may be cultural. Minority students often must fit into two cultures at once. The dominant culture is inherent in our school systems, while a student from a minority background has his or her own cultural values to conform to as well. Reyes et al. add that Latino children are taught to respect authority and therefore are likely to be less vocal in classes. The lack of participation impacts how teachers view their abilities. African-American children for example, are taught interdependence and cooperation, yet the dominant culture in schools focuses on independence and individual achievement. In response to Reyes et al.'s (2000) findings, the Chicago school system is working to minimize school transitions by having students attend K-8 schools and then ninth-grade through twelfth-grade schools. The transition to and from middle school is thus avoided.

Approaching school dropouts from a different angle and using locally based data, Alspaugh (1998) looked at dropouts among students in Missouri. Although he did not break his analysis up into ethnic groups, his findings are of interest to this research. Most studies on high school dropout focus on family background, personal problems and school related factors, such as academic success. Alspaugh (1998) suggests that there is a relationship between school organizational characteristics and dropout and also community well-being and dropout. Community well-being was measured in the study by unemployment rates, average family income and also crime rates. School

organization was measured using the size of the schools, units of high school credit (i.e., subjects offered) and also extracurricular activities.

Using some basic relationship techniques of data analysis, Alspaugh (1998) found that larger high schools have much higher dropout rates than smaller schools, a phenomenon that may be attributed to interpersonal relationships developed between teachers and students at smaller schools. Second, there was also a strong correlation between high community crime rates and high dropout rates. Third, a decrease in participation in extracurricular activities also led to higher dropout rates. This is probably due to school size, since there are fewer opportunities for students to participate in extracurricular activities when there are more students with which to compete. Together, these present a multiple factor model for high Latino dropout rates.

Another interesting finding was that broad course offerings did not decrease dropout rates (Alspaugh, 1998). Many school officials have tried to offer a broad range of courses hoping that students would find the additional subjects interesting and therefore would stay in school longer. Alspaugh's finding is in agreement with Pittman's (1991) study and also Pittman and Haughwout's (1987) study. However, other studies have found that increasing the amount of homework and increasing the level of course-work do prevent dropout (e.g., Rumberger, 1995). Alspaugh found that the lowest high school dropout rates were found in small, rural schools. These are schools that are predominantly white. Latino students are more likely to be in schools that are large, and are located in low-income communities with high crime rates (Pittman, 1991).

Alexander, Entwisle and Horsey (1997) propose that tendency to drop out is developed over the life course. Using a sample of students from Baltimore, a city that has high proportions of minorities and many people in low socioeconomic groups, the authors tracked students' academic progress from their first day of school until high school completion or dropout. Baltimore has a very high dropout rate; the 1997 NCES data estimate this at 30%. The authors maintain that looking at students early on in their academic life is important, given that academic performance and attitudes toward academics, as well as conduct, are all established in the first grade. Further, school officials often slot or "track" students into categories at an early age, and this categorization tends to follow students through their school experience.

Alexander et al. (1997) used variables measuring a child's person resources, family context and school experiences, in addition to the usual demographic variables. Items asking about attitudes toward self and school were posed to measure personal resources. Family context measures focused on family stressors, and parents' attitudes, values and socialization practices. School experiences were measured using items that asked students' about their academic achievement, such as test scores and grades in mathematics and reading, and also whether there were track placements in the school. Several measures of dropout were used in the study.

Using logistic regression models, Alexander et al. found that parents' attitudes toward education were highly significant, as were family stressful conditions. Among the students' school experiences, academic performance, reading level, track placement and other academic achievements were also extremely important predictors of dropout. These variables were all statistically significant independent of demographic variables. The

demographic variables that had a significant impact on dropout rates were: low socioeconomic status, being male, having a large number of siblings, being born to a young mother and coming from a single parent household. Ethnicity was not a significant focus in this study, since the researchers only compared black to white dropout rates. Further, the small differences in dropout by ethnicity were obscured when socioeconomic status (SES) was controlled for. The authors concluded that the process of academic disengagement is an area that needs to be further studied, and they criticized current studies for failing to examine this long-term social process.

In a qualitative study, Hebert and Reis (1999) looked at high achieving minority students in urban schools. This study examined the opposite side of the fence, in that, instead of focusing on why youth drop out of school, the focus was on why youth stay in school and what motivates them to achieve. Their findings indicate that although there is a difference in how students rated the following factors in importance, they all contributed to students being successful. These factors were: a strong belief in self, supportive adults, a network of achieving peers, extracurricular program, challenging learning experiences, personal characteristics, resilience, and family support. Such factors can be used to help motivate other students. This was one of several qualitative studies identified during the course of this literature review.

In another, involving focus group interviews with Chicano/Latinos (appropriated by many Mexican descendants as reflective of their unique culture) who had dropped out of high school, Aviles, Guerrero, Howarth, and Thomas (1999) found several areas where students reported difficulties. These problematic areas included attendance, participation

in school activities, alternative educational programs, expectations of teachers and staff, and personal situations. As the authors reported in their results of the study:

Possibly the most important finding in this study was the view that Chicano/Latino students who left high school were not dropouts. Rather, group members consistently and distinctly reported what can best be described as being facilitated out. The combination of lowered teacher expectations and encouragement on the part of school personnel to opt out of mainstream education facilitated a steady exodus of Chicano/Latino students out of the school system (p. 469).

The qualitative approach of research is informative in that it deviates from the many other studies that focus on national data that tend to obscure local trends (Chiricos, 1987).

Local Level Studies

Using a sample of high-ability students from a northeastern, urban high school, Hebert and Reis (1999) investigated relationships and support systems that help youth stay in school and the most important factors in achieving academic success. The high school where the study occurred was described as looking similar to an industrial plant (i.e., few windows and in need of repair). The student population was 60% Puerto Rican, 20% African American, and 20% white, Asian and other ethnic groups.

Almost all students in the sample were from families of low socioeconomic status and half lived in subsidized housing. Most of the students also came from families with multiple siblings. Thus, many of the risk factors for dropout were present. However, these students all exhibited superior academic performance. All students in this study credited

an adult role model with motivating him or her to strive for academic honors. These adults were usually teachers and coaches and, occasionally, mentors from community programs. Several students commented that teachers who gave the students some choice in their curriculum captured student interests, and students subsequently performed much better in those classes. Unfortunately, such choices move school officials away from focusing on standardized testing and other means of developing consistent and reliable data (Herbert & Reis, 1999).

Other students in this study cited high expectations and positive comments from teachers as motivators behind achievement. This finding concurs with many years of teacher research that reports teachers who project high expectations on students eventually see those expectations reflected in performance (Good, 1980; Rosenthal & Jacobsen, 1968). Another important finding from the Hebert and Reis's (1999) study is the role parents play in students' academic success. Most students in the sample had extensive social support from their parents and usually this amounted to emotional support only as financial support was impossible. One student cited his parent's tremendous sacrifice to allow him to succeed and he felt obligated to do so.

Many of the studies discuss cultural beliefs and practices among Latinos, yet few discuss what those beliefs and practices actually are. Carter's (1983) study for example, although written to explain Latino cultural clashes with the criminal justice system in Texas, offers some other important insights about Latino culture. These insights can be applied to the educational setting and may help explain why Latino males have such a high likelihood of dropout.

Carter (1983) identified four cultural elements: 1) familial roles and norms, which include a centralized family structure with a male authority figure; 2) a "personalistic" sense of loyalty and honor, defense of which is a necessity; 3) arrant sensitivity to insults, that includes an exaggerated sense of machismo; and 4) immediate dominion which refers to reacting to a situation with little long-term view of the consequences. With regard to familial roles and honor, academic failure may be seen as a sign of weakness, so it is theorized, instead of attacking the problem, Latino males may drop out of school to save face. All of these cultural elements, particularly regarding English fluency, are frequently misinterpreted by the dominant culture and these misunderstandings can lead to interpersonal conflicts and systemic conflicts.

Teachers and school officials are, more often than not, part of the dominant Anglo-culture. Such officials often misread language differences in Latinos as a sign of low intelligence; they may see sensitivity to failure as bad temperament, and upholding Latino cultural values as "un-American." Any one of these things could result in conflict between the teacher/ official and the student, and could have long-term consequences on the student's education and future economic opportunities. Carter (1983) concluded that in this context, better understanding of Hispanic/Latino culture is an essential part of making education possible.

Hess and D'Amato (1996) took a unique approach at examining some of the potential differences between high school dropouts and persisters among Mexican-Americans. Their sample consisted of 80 Mexican-American children in grades 3 through 5, and although no specific place is mentioned, the size of the sample would suggest it is derived from a small geographical area. Half the children had at least one or

more older siblings who had dropped out of high school while the other half had one or more older siblings who were considered to be high school persisters. Many studies on dropouts use data from students who have already dropped out. By using children in elementary school, risk indicators may be identified early on in a student's schooling. The results of the study found that for elementary age Mexican-American children, school absences and expectations of high school completion were significant factors in differentiating siblings of persisters from siblings of dropouts.

In a study conducted by the Latino Coalition (University of South Florida's Florida Mental Health Institute, and the Children's Board of Hillsborough County, 2000), some major findings on the Latino dropout phenomena are reported. Although the major focus came from qualitative methods, descriptive statistics for demographics on "all students identified as Latino" and school characteristics are also reported.

The exploratory study aimed to gain an understanding of the factors contributing to the high attrition rate of Latinos in the school district. Focus groups and semi-structured in-person and telephone interviews were conducted with three groups of students: high achieving students, at-risk students, and dropout Latino students. Community representatives, school system personnel, principals, and teachers were also involved in the information gathering process.

From the data on Latino students in the school system database, the researchers developed a profile of Latino student risk factors for those who drop out or are at risk of dropping out. The sample size for this analysis was 19, 350 students, attending one of 79 elementary schools, 33 middle schools, 19 high schools, or 9 exceptional education schools. As already discussed, only socio-demographic factors and school factors were

selected for analysis. The findings revealed that Latino students had a higher probability of leaving school if they were:

1. Eligible to receive free meals.

2. Classified as monolingual or predominantly Spanish speaking.

3. Included in Exceptional Education and Alternative Education or placed in disciplinary programs, juvenile justice programs, or substance abuse programs.

4. Identified as having irregular attendance, frequent tardiness, having been retained in grade, and assessed as being low achievers (Latino Coalition, 2000).

The Latino Coalition (2000) suggested the need for more focus on middle-school dropout prevention programs where there is a high ratio of Latino students to Latino administrators and teachers. Their conclusions agree with studies that report students' perceptions of "not belonging" and "no one to talk to," the feeling of "no connection to school," found in previous dropout research.

The study recommended that in addressing the attrition rate of Latino students, causes must be understood to be multi-faceted and this fact needs to be understood by those involved in finding solutions. The authors conclude, "…stakeholders of this issue share responsibility for addressing the need for consistent parental and professional support, outreach and improved dissemination of information, and awareness of the cultural issues that impact on students' decision to leave school" (Latino Coalition, 2000).

Another local study addressed one of the factors considered to affect the dropout phenomena, that of out-of-school suspensions. Conducted for the Hillsborough Constituency for Children (Raffaele, 2000), the study aimed to gain greater

understanding of factors related to excessive out-of-school suspensions in the county and how schools, families, and communities can work together to find better ways to combat this problem. Using the data from the 1996-97 school year, with a sample size of 145,903 students, 33,620 of them experienced out-of-school suspensions, an overall rate of 23%. Looking at gender, although boys and girls are equally represented in the school district, 73% of the suspensions were boys while 27% were girls. Latino students were proportionately represented; they made up 18% of the student population and were responsible for 17% of the suspensions.

The study noted common characteristics of students with multiple suspensions. These were identified as:

1. Low parental support / Family dysfunction

2. Disrespect for authority / Poor attitude

3. Self-esteem problems

4. Poor achievement / Not involved in school

5. Truancy /Tardiness / Inconsistent attendance

6. Gang involvement / Juvenile delinquency

7. Behavior and/or Social problems

8. Low SES

9. Substance abuse

Behavior and/or social problems were the most reported characteristic at all school levels. Over 50% of the schools at each level reported this characteristic. Disrespect for authority, poor achievement, and low parental support were also frequently reported by the schools.

42

Gender Differentials

This research is primarily interested in the factors that are related to the large number of Hispanic/Latino males not finishing their high school education. It has been well documented in the numerous studies that are included in this review that there are a multitude of variables that contribute to young students' decisions to drop out of school. It seems that ethnicity and gender play a significant role in dropping out of school and the following is some of the empirical evidence that has been reported.

In an American Association of University Women study (2001), although their aim was to bring forth publicly the "Troubling Label for Hispanics: Girls most Likely to Drop Out," awareness, it was compared to other group of girls in the United States. It was reported that, "according to government data, 26 percent of Hispanic girls leave school without a diploma, compared with 13 percent of Black girls and 6.9 percent of White girls. The only group that has a higher dropout rate among all students is Hispanic boys. Thirty-one percent of Hispanic boys drop out, compared with 12.1 percent of Black boys and 7.7 percent of White boys" (p. 13). (see also McGlynn, 2001, p. 30).

In a study to show race-ethnicity and gender differences in reasons for dropping out of school, Jordan, Lara, and McPartland (1996), found that across the race-ethnicity groups and the gender groups, school related factors were the most cited reasons for early dropout. Using the NELS: 88 database, a factor analysis categorized the various dropout reasons into a smaller number of measures. The extracted 7 factors from the original 21 items were: Family-related, School-Related, Work-Related, Safety, Suspensions, Mobility, and Friendship reasons.

Hispanic and White males reported job-related reasons for dropping out second to school-related reasons although for African American males, the second most reported reason was suspension or expulsion. For the females, the family related factor was the second most reported although for the White females, job related reasons was second with family related a very close third. The biggest differences in the study were gender differences although several ethnic/racial differences were also found. Males reported the primary reasons for dropping out were school-related, job-related and, suspension and/or expulsion. Females reported school-related, family-related and, job-related as their primary reasons for leaving school (Jordan et al., p.76).

Hall and Rowan (2001) wanted to determine the characteristic differences of Hispanic-American males and institutions of higher education which enable academic failure. Here again, although the researchers' interest for their study differed in that their purposes were aimed at higher education, many of the described differential status for Hispanic-American males and the reasons they give for dropping out or graduating from college may be useful in looking at the younger student population.

In their review of literature, citing Hall (1994), Rowan and Hall (2001) state, "...over 40 percent of Hispanic-American males separate from school before completing the requirements for promotion to the tenth grade." This figure alone is one that should be a wake-up call to education practitioners. To allow this many students to fall through the cracks of the schooling system needs to be addressed. Concluding, Hall and Rowan lament, "Given the current state of higher education, the ultimate sacrifice will be borne by the society in the loss of their human development and productivity" (2001, p. 572).

In attempting to create a comprehensive model of the school leaving process among Latinos, Velez and Saenz (2001) identified and reported on three clusters of factors: individual factors, family factors and, structural factors. The authors concluded that modeling the school dropout process requires a theoretical approach that incorporates all three types of predictors. Several recommendations regarding research and data needs were presented for the benefit of future studies. As they stated:

> Despite the serious nature of the Latino dropout phenomenon not only for the Latino community but for the nation as a whole, there continues to be an absence of data for the study of Latino dropouts. One of the most serious problems plaguing research based on the Latino population in general is the absence of historical data to assess changes over time. Another important area with policy implications that begs for empirical attention is the issue of gender and education (p. 461).

Specifically, the ways that would enhance our understanding of the school leaving process of Latinos are reported as:

1. Development of a nationally representative longitudinal survey to capture the school leaving process of Latinos.

2. Development of inventories to compile information about successful programs that have made advances in reducing the dropout problem of Latino youth.

3. Development of a clearinghouse that can compile and organize our knowledge about Latino dropouts.

These suggestions are not only helpful in identifying the difficulties that Latino students are having but also in the design and development of interventions to keep these students in schools.

Survival Analysis: Introduction

Survival analysis is used to determine the time taken before a particular event occurs. Therefore, it not only examines the occurrence of an event, but also its timing. Originally used in medical research, survival analysis was often applied to examining the effects of new treatment procedures on mortality, hence its name (DesJardins & Moye, 2000). In the social sciences, this technique is often referred to as event history modeling or hazard modeling. It has been used extensively in sociology, but has only recently been introduced to education research (DesJardins & Moye, 2000; Denson & Schumacker, 1996).

Survival analysis usually relies on logistic regression modeling if the technique is parametric and the Kaplan-Meier Method if the technique is non-parametric (Satten & Somnath, 2001). Logistic regression is used when the dependent variable is dichotomous and the independent variables are measured at least at the interval level. Models are estimated using maximum likelihood rather than ordinary least squares as in linear regression (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

In looking at the timing of educational events using survival analysis, there are several methods. Schumacker and Denson (1994) reported on an approach to interpret interaction of predictor variables with time in a discrete-time method. Previous continuous-time methods did not allow for the use of both time-invariant and time varying predictor variables.

Studies in Education Using Survival Analysis

In a study that examined attrition among college students, DesJardins and Moye (2000) used data from the High School and Beyond/ Sophomore Cohort, and conducted a survival analysis. The initial model contained several variables such as gender, academic resources and whether the student was a parent at a given time. Subsequent models added financial aid variables, grade point averages and different components of academic resources such as academic intensity, high school rank and senior year test score. By running time comparison models and models that did not consider time, DesJardins and Moye found that the models incorporating time were better predictors of graduation as some predictor variables had less effect over time while others had more (p. 18). The authors advocate that this last finding is very important since it highlights the importance of examining variables over time, rather than examining them as unchanging events.

Ronco (1995) used competing risks survival analysis to investigate whether students who enroll at a university will graduate, withdraw or transfer. Data used for this study were taken from Texas Department of Education's database of first time enrolled college students. Competing risks referred to the different types of exits from the institution. Predictor variables examined included ethnicity, gender, enrollment status, GPA and major. Note that some of these variables are time varying, for example, enrollment status and GPA, and others are not. Ronco used ordinary least squares regression to select the variables for the logistic regression model and excluded those that were not significant.

Results from this study indicated that the hazard rates for withdrawal or transfer were highest after the second semester. Rates remained fairly high until the seventh

semester upon which time some students began to graduate. After graduation began, hazard rates peaked, but are only artificially high since the risk pool has decreased substantially by this point. Ethnicity was the only stable variable to remain significantly related to all three types of exit. Latino students were less likely to transfer to another four-year school or dropout, but also were much more likely to transfer to another two-year school (p. 16). Ronco (1995) proposes that this may be because Latino students move to find a college that better suits their needs.

Willet and Singer (1995) used a technique known as multiple-spell discrete-time survival analysis to study the sequential occurrence of exit from, and reentry into the teaching profession. They explored the occurrence of this pair of alternating events in the lives of special educators, the events of leaving, and then returning to teaching. Twelve years of longitudinal data that described up to four spells for each educator were: (a) first spell in teaching, (b) second spell out of teaching, (c) third spell in teaching, and (d) fourth spell out of teaching.

Their results were promising for the use of multiple-spell discrete-time survival analysis although difficulty was found in conforming to the independence assumptions. As they concluded:

> The lack of independence is a problem that is not unique to multiple-spell discrete-time survival analysis. In fact, the same dependence also occurs across consecutive time periods within a single spell. Hence, both discrete-time and continuous-time survival methods designed for the analysis of single spells - including the popular Cox continuous-time proportional-hazards model- suffer from exactly the same drawback (Willet & Singer, 1995, p. 61).

In a study that examined student dropout among first time 9th graders in Dallas Public Schools, Denson and Schmacker (1996), followed students over a four year period. Again, this study used competing risks which were: withdraw, dropping out, graduation, still enrolled after four years, no-show, and unknown. Predictor variables examined were such factors as gender, ethnicity, special education enrollment, poor English skills and overage. Results from this study indicated that the hazard rate for graduation was 81% for any student remaining in the risk pool after the second semester of 12th grade. Dropping out and withdrawing were greatest until the senior year. All ethnic groups were at the greatest risk of dropping out during the 9th grade. This effect was particularly strong for Latino students. Further, those with lower proficiency in English were also more likely to drop out than proficient English speakers.

Summary

This review addressed many variables, both singly and in combination, that can positively or negatively affect dropout among middle and high school students. The demographic conditions that had a significant impact on dropout rates were: low socioeconomic status, being male, having a large number of siblings, being born to a young mother, and coming from a single parent household.

Among the students' school experiences, poor academic performance, low reading level, lower track placement and other poor academic achievements were also extremely important predictors of dropout. Also included are attitudes toward education and expectations of the students, number of school transitions, school/classroom environment, size of the schools and the availability of extracurricular activities. Regarding the value one puts on fellow classmates, males of Latino and African

49

American ethnicity are placing a higher value on low achievers and other intangibles and not on academics.

Negative effects on students' ability to continue with their education include family stressful conditions, large schools, and high crime rates of communities. Some factors surprisingly may not have much of an effect on the dropout phenomenon. For example, recency of immigration had unexpected results in that third generation students had higher dropout rates than second or first generation students. The expectations were that the children of immigrants having most recently arrived would encounter more difficulties and therefore dropout at a higher rate than those of second or third generation families.

Other factors that have been shown to contribute to the high attrition rate of Latino students are eligibility to receive free meals, classification as monolingual or predominantly Spanish speaking, inclusion in Exceptional Education and Alternative Education programs or placement in disciplinary programs, juvenile justice programs, or substance abuse programs, identified as having irregular attendance, frequent tardiness, having been retained in grade, and low achievement.

This investigation looks specifically at Hispanic/Latino male students' age, home language, retention history, program of studies and, behavior. In addition, various academic achievement variables are studied, including: reading scale scores, math scale scores, and students GPA. In addition to identifying whether these variables may be good predictors, the aspect of time is investigated to see when it is that "critical moments" or high risk time periods occur in students' educational lives, first of all as students and then specifically, as experienced by Hispanic/Latino male students.

50

Chapter Three

Method

This study is a secondary analysis of public school data from a large urban school district in the state of Florida. A longitudinal approach was employed; a sample consisting of Hispanic/Latino male students in the 8th grade in 1995-96 was followed every year to the year 2000-01. Although the graduating year for this group of students was 1999-00, data were collected until the year 2000-01 to provide information on students not graduating "on time." The goal of this investigation, utilizing logistic regression and survival analysis as the method of inquiry, is to report survival probabilities of Hispanic/Latino male students. In other words, when are students at "greatest risk" for dropping out of school? What are the students' achievement characteristics as they relate to student dropout?

The research questions this study addresses are the following:

1. What is the relation between age, home language, retention history, free/reduced lunch, program of studies, behavior (disciplinary suspensions), reading achievement, mathematics achievement, and GPA and dropping out of secondary school by Hispanic/Latino males?

2. At what grade levels do the predictor variables begin to affect the male Hispanic/Latino students' propensity for early school leaving? When are they at greatest risk?

In addition to computing and plotting the estimated survival functions, differences between the covariates on survival probabilities were interpreted. In the final analysis, this investigation tested the model to examine which predictors were "best" for predicting dropout. All statistical analyses were computed using the Statistical Analyses Software package (SAS, 2000-2004).

Participants

The population from which the sample was drawn was contained within one of the school districts in the state of Florida. From the most recent data available on this district, the total number of Hispanic/Latino male students entering eighth grade was obtained. The data were collected from all public middle schools in the district (37 schools). The starting year was 1995 when the student population was in eighth grade. These middle schools then funneled the students into the districts' 19 high schools. Data were obtained for the subsequent years of the study, 1996 through 2000, from these schools. Although the projected graduating year for this group of students was 2000, data were collected until 2001 to be sure to include those students for which extra time was necessary for graduation.

The students' demographic information records were used to identify the sample for this study (Hispanic/Latino males). In addition to individual variables considered as predictors, multiple variables acting in concert to affect dropping out were analyzed. Differences in duration times of dropouts were investigated to identify the variables associated with leaving school.

Procedures

A letter requesting student data from the school district was sent to the head of the county school assessment and evaluation department. The importance of the research was noted in that information on the local situation of the dropout problem may be useful in acquiring resources to help those at risk and acquire funding for possible interventions.

In order for the study to proceed, approval from the Institutional Review Board (IRB) indicating the study met federal guidelines for the protection of human subjects was requested and obtained. This approval included an agreement to participate in the study from the school district from which the data were obtained. The county's approval was given under the following conditions:

1. The data to be used were for the years 1995-1996 through 2000-2001.

2. No additional data could be collected or used.

3. Confidentiality had to be assured for all participants. That is, all data had to be aggregated such that the district could not be identified as well as any other participant including parents, students, and administration.

4. Student data had to be destroyed when the project has been completed.

The sample for this research was taken from the population of public school eighth graders in the district in the 1995-1996 school year. These students were in the 37 public middle schools in the district. From the entire population of eighth graders in the county, using withdrawal codes as criteria, the sample was made up of only those students who reported being Hispanic/ Latinos and male and attended public school in the school district. The total number of Hispanic/Latino male students in the collected sample was 1,076.

The data were coded by an identification numbers only; this number was required to follow the student for the five year duration of the study. No names were used to insure anonymity. The data were collected from all middle schools in the district (37 schools); this sample was comprised of Hispanic/Latino male students enrolled in the eighth grade during the 1995-96 academic year and followed for the subsequent five years. These middle schools fed students into the districts' 19 high schools. Data were obtained for the subsequent years of the study, 1996-97 through 2000-01, from these schools. As stated previously, although the projected graduating year for this group of students was the 1999-2000 school year, data were collected through Spring 2001 to be sure to include those students for which up to one year extra time was necessary for graduation. Operational definitions and codes of the variables follow in the next section.

Dependent Variable

The dependent variable, time in *days* enrolled in this study, was calculated by adding the maximum number of days students were enrolled for each of the six years of the study period. The years included in this study are 1995-96 through to 2000-01. For the 1995-1996 school year the maximum number of days enrolled was 180 days. For 1996-97 and 1997-98, ninth and tenth grade, respectively, the school year was made up of 180 days enrolled also. In the school years of 1998-99, and 1999-2000, the maximum number of days enrolled was 179 days. The last year of the study was included as stated previously to include students needing an extra year to complete their education. This last year of 2000-01 had 184 days enrolled making up the school year. Summing up the days enrolled for these six years results in a total of 1082 days in school.

Dropout or non-dropout (possibly censored), the *status* variable, is identified by the withdrawal codes used by the school district. This district has 29 different withdrawal codes, of these, 17 were used as identification codes for this study sample. The first seven codes correspond to students who have dropped out and the remainder of the codes to the censored students. Those students who were defined as dropouts were coded 1 and non-dropouts were coded 0. To identify the dropout students, the 17 withdrawal codes used are listed below:

1. W05 – Any student over compulsory attendance age who leaves school voluntary with no intention of returning.

2. W13 – Any PK-12 student withdrawn from school due to court action.

3. W15 – Any PK-12 student who is withdrawn from school due to non-attendance.

4. W21 – Any student who is withdrawn from the rolls due to being expelled from school.

5. W22 – Any PK-12 student whose whereabouts is unknown.

6. W24 – Any PK-12 student who is withdrawn from school to attend a home education program.

7. W26 – Any student who leaves to enter the Adult Program within the district prior to completion of graduation requirements.

8. W01 – Any PK-12 student promoted or transferred to another attendance reporting unit in the same school.

9. W02 – Any PK-12 student promoted or transferred to another school in the same district.

10. W2A – Any student who was withdrawn following an expulsion hearing resulting in a change of placement in lieu of expulsion.

11. W03 – Any PK-12 student who withdraws to attend another public school in or out-of-state.

12. W04 – Any PK-12 student who withdraws to attend a non-public school in or out-of-state.

13. W06 – Any student who graduated from school with a standard diploma.

14. W07 – Any student who graduated from school with a special diploma based on option one-mastery of student performance standards.

15. W08 – Any student who left school with a certificate of completion.

16. W12 – Any PK-12 student withdrawn from school due to death.

17. W27 – Any student who graduated from school with a special diploma based on option two-mastery of employment and community competencies.

The censored students comprised the remaining withdrawal codes that include codes identifying censorship such as graduating with a standard diploma, graduating with a special diploma, leaving school with a certificate of completion, transferring to another school, and other codes that identify the reasons for students no longer "in" the school system. These are the students considered censored for the study. In other words, none experienced the event of interest. They completed their education in some way or left and were accounted for by the school district's withdrawal codes.

Independent Variables

The independent variables for the study are the following: 1) age, 2) home language, 3) retention history, 4) free/reduced lunch, 5) program of studies (four levels), 6) behavior (disciplinary suspensions), 7) GPA (State), 8) FCAT writing scores, 9) FCAT reading achievement scores, and 10) FCAT mathematics achievement scores. The *age* variable, a continuous variable, was converted to months and then years for the analyses as a decimal to record yearly progress more accurately; this approach was used to better identify a more precise point in which events occurred.

The *home language* variable was dichotomized from information gleaned from the data file. Students' school record applications ask two questions pertaining to language; one asks about a student's home language and a second asks about a student's native language. For purposes of this study, if a student's report identified Spanish in either the native or home category, then the *language* variable was noted as Spanish being the student's language. If English was noted in both the home and native categories, then the *language* variable was noted as English being the student's language. Spanish was coded 1 and English is coded 0.

The *retention history* variable was also dichotomized. Each individual's grade was reported and identified for the 5 years span, the duration of the study period. For those students whose grade was reported as the same for consecutive years, they were noted as having been retained. All others showed that they were in eighth grade in 1995 and the twelfth grade in 1999. This variable was coded 1 for yes, at least once, and 0 for never retained.

Social Economic Status was determined by the meal status variable. District

identifiers used in this study were:

0 – Did not apply

2 – Free Lunch

3 – Reduced Lunch

9 – Free Meals Direct

Students identified with district codes for free lunch, reduced lunch, and free meals

direct were combined to identify the *free/reduced lunch* dichotomized variable. All

others comprised the no *free/reduced lunch* category; for this study, non participation

was coded 0 and participation was coded 1.

The *Program of Studies* variable had 9 codes in the district. These were

designated as follows: AS - Academic Scholar, AT - Academic Scholar / Technical Prep,

CP - College Prep, CT - College / Technical Prep, GE – General, IB - International

Baccalaureat, TC - Technical / Career, TP - Technical Prep, and VO – Vocational. For

this study, four categories were formed. The college preparatory category, coded 1,

included the AS, AT, CP, CT, and IB programs. The technical preparatory category,

coded 2 was made up of the TC, TP, and VO programs. The general studies category,

coded 3 comprised the GE program of studies. The fourth category, unclassified, was

made up of the students without any classifications and was coded 4. This variable was

then dummy coded for the analysis with the general studies as the reference category.

Behavior (suspensions) was a continuous variable and represents total incidents

reported. The district uses three separate variables to identify problematic behaviors by the students although this study used suspensions as the variable of interest. Using the longitudinal data totals for the three variables-- disruptive behavior, disciplinary referrals, and suspensions-- a correlation analysis was performed. Due to high correlation coefficients between suspensions and disruptive behavior, r = .95, suspensions and referral history, r = .92, and disruptive behavior and referral history, r = .86 respectively, the researcher used total number of suspensions as the identifying behavioral variable.

Achievement (GPA) was the first of the achievement predictor variables. Although the district records a district GPA and a state GPA, only the state was used for this analysis. The district incorporates a scale that exceeds 4.0 due to specialized courses and therefore the researcher decided to keep the uniform 4.0 as the maximum for this study. The recorded GPA in 10th grade was used for this variable. For students missing a GPA for 10th grade, GPA in 11th or 12th grade was used for this study, if available.

The three remaining achievement variables (FCAT Writing, FCAT Reading, and FCAT Mathematics), were analyzed using the districts FCAT scores for these subject specific variables. The Writing scores were reported on a scale of 1 to 6 scale in half unit increments. Although two types of writing are assessed, expository and persuasive, these were reported as one since too few students had scores for both. The FCAT Reading scale and the FCAT Math scales used the same scale, 100-500. All FCAT scores were from the 10th grade administration of these standardized tests. A correlation analysis was performed to see the relationship of these three achievement variables and GPA (see Table 1).

In the Pearson correlation analysis, there were moderate to moderately high correlation coefficients ranging from .48 to .75 among the four achievement predictor variables of GPA, FCATWRIT, FCATREAD, and FCATMATH. As the FCAT achievement test scores go up, the state GPA scores tend to increase also and vice versa. The researcher used GPA as the identifying achievement variable due to the sample size being diminished considerably by including the FCAT achievement scores. All three FCAT scores cut the sample size nearly in half and so it was decided to use GPA as the sole achievement variable.

Table 1

Correlation Coefficients of Achievement Predictor Variables

	GPA	FCAT Writing	FCAT Reading	FCAT Math
GPA	1.00000 865			
FCAT Writing	.49 520	1.00000 532		
FCAT Reading	.52 495	.56 471	1.00000 496	
FCAT Math	.58 495	.48 471	.75 472	1.00000 495

Note: All correlations were statistically significant ($x< .0001$).

This being a secondary analysis of collected data of public school students, there is the question of data accuracy. Prior to reaching the final database where the data are stored, student data are recorded and inputted by numerous individuals. Therefore there is no surefire certainty that all data entry was without error. This being the case, there is difficulty in establishing with absolute certainty, the accuracy of the data in the study.

60

Hope and good faith acceptance that the data collection followed social research

procedures properly and without human input errors is acknowledged and warranted.

Analyses

The first data analyses were descriptive to ascertain the characteristics of the

sample. Sample sizes of Hispanic/Latino male students, means, standard deviations and

ranges were calculated. Differences between dropouts and non-dropouts were examined

as well as those differences among the covariates. Relationships and associations among

demographic and achievement variables were reported. Finally, survival probabilities and

hazard rates were calculated and interpreted.

The independent/predictor variables are those listed below which were selected in

a more heuristic method from those available at the school district. Several survival

models were developed and separate analyses performed to identify variables for

inclusion. Time was the dependent variable and those "best" predictors were incorporated

into the several models formulated. Models were developed to predict which students

graduate and which do not graduate. The models also examined whether the variables

that predict dropping out at some specific time-point for some Hispanic/Latino male

students were the same as those used to predict dropping out at a later time-point for

other students.

This survival analysis was conducted using longitudinal data on a cohort of

Hispanic/Latino students in grade 8 in 1995-1996 and followed for 6 years to 2000-2001.

The event of interest was dropping out of school. This study investigated the probabilities

and hazard risks of this event - the students' success or failure to graduate from high

school.

Description of the sample as a whole was done by analyzing the duration of school engagement indirectly through two mathematical transformations of duration: (a) the survivor function and (b) the hazard function. These transformations remain meaningful in the face of censoring; in this study, censoring would include graduation or leaving the study prior to its 5 years span for "other" reasons. The survival-probability distribution function at time t is the probability that a randomly-selected member of the population will "survive" beyond t : $S(t) = $ Prob [survival beyond t]. The hazard function is the probability that a randomly-selected member of the population will "dropout" in the interval between t and $t + 1$, given that the individual has survived until the beginning of that same interval: $h(t) = $ Prob ["dropping out" between t and $t + 1$ / survival until t]

(Anderson et al., 1980, p.205).

This is followed by identifying survival probability times and predictors of duration by comparing survivor plots computed separately for students who share specific values of the predictors in this study.

The proportional hazards model, considered semi-parametric, has several advantages over parametric approaches in that it does not require the researcher to choose a particular probability distribution to represent survival times, as do parametric methods. Second, the Cox regression, as it is often called, can incorporate time-dependent covariates (i.e., those variables that may change in value over the course of the study). Lastly, the proportional hazards model can readily accommodate both discrete and continuous measurement of event times.

As a foundation to understanding this process, an explanation of the three different ways of describing probability distributions will be introduced. First, the cumulative distribution function (cdf) of a variable *T*, denoted by *F*(t), is a function that tells us the probability that the variable will be less than or equal to any value *t* that is chosen. As an equation, it would look like this, $F(t) = \Pr\{T \leq t\}$. Knowing the value of *F* for every value of *t*, gives us all there is to know about the distribution of *T*. More commonly used in survival analysis is the closely related function called the survivor function, defined as $S(t) = \Pr\{T > t\} = 1 - F(t)$. One can intuitively see the similarities. The survivor function gives the probability of surviving beyond *t,* a specific point in time (Allison, 1995).

One of the research goals in the present analysis was to compare survivor functions for the cohort of Hispanic/Latino male students in this sample. If the survivor function for certain individuals is higher or lower than the survivor function for other individuals, then these differences must be investigated. If the survivor functions among these individuals cross though, interpretations may be unspecifiable.

A second way of describing probability distributions with continuous variables is the probability density function(pdf). This function is defined as $f(t) = \dfrac{dF(t)}{dt} = -\dfrac{dS(t)}{dt}$ the p.d.f. is just the derivative or slope of the c.d.f.. The well established normal curve or bell-shaped curve as it is also known to be associated with the normal distribution is given by its pdf, not its cdf (Allison, 1995).

The major functions being used to relay the results of this study are the survivor function and the hazard function. This latter distributional function is called the

hazard function and has become more popular then the p.d.f. in describing distributions.

This function is defined as $h(t) = \lim\limits_{\Delta t \to 0} \dfrac{\Pr\{t \le T < t + \Delta t \mid T \dots t}{\Delta t}$ instead of $h(t)$; some

authors denote the hazard by $\lambda(t)$ or $r(t)$, (Allison, 1995).

With this background on some basic understanding of three different ways of describing probability distributions, a more specific detail of the survival analysis method of this study can now be told. This analysis incorporates a mathematical model most commonly used for analyzing survival data, the Cox proportional hazards (PH) model.

Of interest in this analysis is the survival experience of this cohort of eighth graders as they progress in their education. This study investigated whether certain variables have confounding effects on student dropout in addition to interaction effects among several variables on student dropout. Are these explanatory variables good predictors of surviving to graduation. Survival time *T*, denotes "days enrolled in school." The explanatory variables were labeled *X1, X2, X3,..,Xp.* The variable X1 was the primary, "dropout variable." The variables *X2-X3...Xp* were the extraneous variable included as possible confounder or interaction covariates.

The formula for the Cox Proportional Hazards model is usually written in terms of the hazard model formula as follows:

$$h(t, X) = h_0(t)e^{\sum\limits_{i=1}^{p} B_i X_i}$$

this model gives an expression for the hazard at time *t* for an individual with a given specification of a set of explanatory variables denoted by *X,* which represents a collection of predictor variables that is being modeled to predict an individual's hazard. The Cox model formula says that the hazard at time *t* is the product of two quantities. The first of

these is the baseline hazard function, $h_0(t)$. The second quantity is the exponential

expression e to the linear sum of B_iXi, where the sum is over the p explanatory X

variables (Kleinbaum, 1996).

The model contains 7 predictor variables (i.e., age, home language, retention

history, free/reduced lunch, program of studies (four levels), behavior (disciplinary

suspensions), and GPA (State). The independent variables, as noted above, summarize

the joint influence among these variables on the hazard-rate and allow for interactions to

be evaluated.

To evaluate the possible effects of the various variables on Hispanic/Latino

dropouts, in addition to interpretation of potential interaction effects, a number of

statistics were reported. These include: regression coefficients corresponding to each

variable in the model, standard errors of the regression coefficients, p-values for testing

the significance of each coefficient, and hazard ratios for the effect of each variable

adjusted for other variables in the model.

The last piece of information to be interpreted in this preliminary analysis is the

P(PH). This information is used to evaluate the proportional hazards assumption. The

value given is a p-value derived from a standard normal statistic computed from the

model output. Non-significance would be interpreted from a p-value larger than 0.10,

indicating that the PH assumption is satisfied, whereas a small p-value, say less than 0.05,

would indicate that the variable being tested does not satisfy

this assumption (Kleinbaum,1996).

In addition to the above analysis, survival curves for the sample of students were

plotted, as well as survival curves adjusted for the effects of the various variable in the

different models. These curves give additional information describing model comparisons over the time period of the study. It is the survival curves along with hazard ratios which are of primary importance in survival analysis. Having survival times and the possibility of censoring are the reasons it is the preferred method over logistic regression, which considers only a dichotomous outcome.

Summary

The research design employed a longitudinal approach. The data were from a large urban school district in the state of Florida. The sample, consisting of Hispanic/Latino male students in the 8th grade in 1995-96, was followed every year to the year 2000-01.

This investigation, using a local level data set, which included only Hispanic/Latino male students in the district, emphasized a focused look at the longitudinal data and put into perspective how the Hispanic/Latino male was affected by the variables and covariates under investigation. Specifically, this study looked at how Hispanic/Latino males and achievement characteristics relate to student dropout. In the final analysis, this investigation reported on the finding of the "best" model, the most predictive regarding which predictors have the greatest effects on students' decisions to complete high school or dropout of school.

Chapter Four

Results

The goal of the analysis is to report survival probabilities of male Hispanic/Latino students of an urban school district in the state of Florida. Using SAS (9.01, 2004), a survival analysis is performed on data from the 1995-96 through 2000-01 study sample. Although conventional statistical methods (i.e., linear regression, logistic regression) have difficulty in dealing with censoring, a logistic regression is applied to glean information for the last school year of the study in addition to the survival analysis on the longitudinal six years of the study.

The chapter is divided into three main sections with subheadings. Section one contains descriptive statistics of the data for both statistical analyses. Section two reports results of the logistic regression and section three reports the survival analysis using the proportional hazard method. These three sections are followed by a summary of the research findings.

Descriptive Statistics of Hispanic/Latino Male Student Sample

The time variable that was used for the study was measured and reported in days. The researcher decided to use days enrolled as the time to event variable since using days present for each year would then lead to bringing the days absent as another covariate and clarity and simplicity of the data were important goals.

The data sample consisted of 1076 Hispanic/Latino male students in 8th grade in the 1995-96 school year. Due to missing values on the achievement variable GPA, the sample size was reduced to 865 Hispanic/Latino male students. Of these 865 students, 268 (30.98%) dropped out of school and 597 (69.02%) stayed in school or withdrew for legitimate reasons (see withdrawal codes under dependent variable section and a frequency table of withdrawal codes in Appendix A). Although exceptional student education (ESE) was not a focus in the study, available codes of the study sample and frequencies are found in Appendix B.

To illustrate the study sample in reference to the national status dropout statistics, the percentage of dropping out were slightly higher in the study than the national status dropout statistics (see Table 2). Whereas the national dropout percentage for Hispanic/Latino students was reported to be 27%, the present study's Hispanic/Latino male dropout percentage was 31%. Also of interest in the national statistics is that male students are dropping out of school at a higher rate than female students, 57% to 43% respectively.

Table 2
Percentages of Hispanic/Latino Male Student Dropouts and National Status Dropouts

Dropped Out of School	Total Sample (N)		National Status Dropouts (in millions)						
			Nation (All)		Ethnicity (W B H)			Gender (M F)	
Yes	268	31%	3.8	11%	7%	11%	27%	57%	43%
No	597	69%	31.4	89%	93%	89%	73%	43%	57%
Summary	865	100%	35.2	100%.					

Note: NCES, 2004, Status Dropout Rate in 2001,
(16-24 year olds out of high school without a credential)

The independent variables in the model are: $X_1 = age$, $X_2 = language$, $X_3 = $ *retention*, $X_4 = free/reduced lunch$, $X_5 = program of study 1 (Coll. prep)$, $X_6 = program of study 2 (Tech. prep.)$, $X_7 = program of study 4 (Unclassified)$, and $X_8 = behavior by suspension$, $X_9 = GPA$,. Three predictors are continuous and four are categorical with one of these (program of study) having several levels indicating the created dummy variables in the analysis.

The mean number of *days* enrolled in school was 681.98 with a standard deviation of 223.89; the range of days enrolled was 78-1082 days (see Table 3). Summary statistics of the number of censored and uncensored values (the *status* variable) are as follows. Of the 865 students, 597 (69%) were censored and 268 (31%) were uncensored, in other words, 268 students experienced the event, dropped out of school.

Table 3

Descriptive Statistics on Hispanic/Latino Male Student Status/Days Dependent Variable

Dropped Out of School	Total Sample (N)	Days			
		M	*SD*	*Skewness*	*Kurtosis*
Yes	268 31%	582. 47	187. 55	-0. 03	-0. 53
No	597 69%	726. 66	224. 62	-1. 11	0. 01
Summary	865 100%	681. 98	223. 89	-0. 67	-0. 69

The distribution for the *language* variable was 490 (57%) Spanish speaking students and 375 (43%) English speaking students (see Table 4). The *retention* distribution was 417 (48%) of the students were retained at some point in their education while 448 (52%) of the students were never retained.

Table 4

Descriptive Statistics on Hispanic/Latino Male Student Language and Retention Variable

_____

Dropped Out of School	Total Sample (N)		Language		Retention	
			Span	Eng	Yes	No
Yes	268	31%	153 57%	115 43%	225 84%	43 16%
No	597	69%	337 56%	260 44%	193 32%	404 68%
Summary	865	100%	490 57%	375 43%	418 48%	447 52%

The *free/reduced lunch* predictor had a distribution of 588 (68%) of students

taking part in the free/reduced lunch program while 277 (32%) were not in the lunch

program (See Table 5). *Program of study* had four levels and the distribution of the

categories was

Table 5

Descriptive Statistics on Hispanic/Latino Male Student Free/Reduced Lunch and Program Variable

_____

Dropped out of School	Total Sample (N)		Free/Reduced Lunch		Program of Study			
			Hi	Lo	Col	Tech	Gen	Uncl
Yes	268	31%	76 28%	192 72%	74 28%	134 50%	57 21%	3 1%
No	597	69%	201 34%	396 66%	287 48%	218 37%	88 15%	4 1%
Summary	865	100%	277 32%	588 68%	361 42%	352 41%	145 17%	7 <1%

as follows: college preparatory was 352 (41%), technology preparatory was 361 (42%),

general study was 145 (17%), and unclassified was 7 (<1%).

The *age* predictor ranged from 15.83 to 20.37 years, with a mean age of 17.69

and standard deviation of 0.64 years (see Table 6).

Table 6

Descriptive Statistics on Hispanic/Latino Male Student Age Variable

_____

Dropped Out of School	Total Sample (N)		Age		
		M	*SD*	*Skewness*	*Kurtosis*
Yes	268 31%	17.85	0.69	0.57	0.47
No	597 69%	17.62	0.61	0.72	0.73
Summary	865 100%	17.69	0.64	0.69	0.65

The next predictor variable was *behavior*. It ranged from 0 to 70 reported total suspensions with a mean score of 8.84 and a standard deviation of 10.43 suspensions (see Table 7).

Table 7

Descriptive Statistics on Hispanic/Latino Male Student Behavior Variable

_____

Dropped Out of School	Total Sample (N)		Behavior		
		M	*SD*	*Skewness*	*Kurtosis*
Yes	268 31%	15.09	12.05	1.03	1.29
No	597 69%	6.03	8.19	2.49	8.02
Summary	865 100%	8.84	10.43	1.77	3.63

The achievement predictor is GPA with a range of 0.33 to 4.00 state GPA. The mean GPA was 2.36 and the standard deviation was 0.60 (see Table 8).

Table 8

Descriptive Statistics on Hispanic/Latino Male Student Achievement Variable

_____

Dropped out of School	Total Sample (N)		GPA			
			M	*SD*	*Skewness*	*Kurtosis*
Yes	268	31%	1.99	0.51	0.49	1.71
No	597	69%	2.52	0.56	-0.04	0.06
Summary	865	100%	2.36	0.60	0.10	-0.03

As summary statistics are being reported, there is one more statistic that should be identified, graduate numbers. Of the sample total of 865 students, 344 Hispanic/Latino male students graduated with a standard diploma, 3 with a special diploma based on option one-mastery of student performance standards, 1 with a special diploma based on option two-mastery of student performance standards, and 1 with a certificate of completion. Adding these as an overall completion of secondary education statistic, of the 865 Hispanic/Latino male students in the six-year longitudinal study, 349 (40%) students completed their education by receiving a standard diploma, special diploma or certificate of completion.

Logistic Regression Analysis

A logistic regression was applied in this phase of the investigation. Whereas in the survival analysis the dependent variable is time, specifically it will be days in school for the students, here in the logistic regression the dependent variable is dichotomous, dropout or non-dropout. To assist in a sound interpretation, the assessment of the model will include an overall evaluation, tests of individual predictors, goodness-of-fit-statistics, and predicted probabilities of the model.

Logistic Regression Analysis Results

 Overall Evaluation.   The results of the overall evaluation testing the global null

hypothesis (all effects are null) indicates that the model is a better fit than the base-line

(intercept-only) model. The test reports significance in the model being a better fit to the

data than the null model. Looking specifically at the likelihood ratio statistic,

significance was found with a, $X^2(9) = 326.4328$, p <.0001.

 Tests of Individual Predictors.   The logistic regression results for the longitudinal

data showed that Predicted Logit of (Dropout) = -9.5709 + (0.5671) * Age + (-0.1769) *

Language + (1.7165) * Retention + (0.3871) * Free/Reduced Lunch + (-0.7152) *

College Preparatory + (-0.4164) * Technical Preparatory + (0.5947) * Unclassified

Program + (0.0513) * Behavior + (-1.0873) * GPA. The log of the odds of a student

dropping out of school is positively related to a student's retention history, positively

related to a student's behavior by suspension, negatively related to GPA, positively

related to a student's age, and negatively related to the college preparatory program of

study (see Table 9).

 Five of the nine predictor variables were found to be statistically significant in the

logistic regression model. Keying on odds ratios, retention history was a strong predictor

in the model. Students made to repeat a grade had odds of dropping out that were 5 to 6

times the odds of those who were never retained during their education after adjusting for

all the other variables in the model. The second significant variable was GPA, this

variable was negatively related to dropping out. A lower recorded state GPA for a

student, resulted in a higher probability of dropping out of school, holding constant all

other variables in the model. Next predictor of significance was positively related to

Table 9

Logistic Analysis of Maximum Likelihood Estimates of Dropping Out

Parameter /Predictor	DF	Coefficient Estimate (*B*)	Standard Error (*B*)	Wald Chi-Square	Pr > ChiSq	Odds Ratio
Intercept	1	-9.5709	2.5284	14.3288	0.0002	
Age	1	0.5671	0.1376	16.9933	<.0001	1.763
Language	1	-0.1716	0.1900	0.8674	0.3517	0.838
Retention	1	1.7165	0.2130	64.9529	<.0001	5.565
F/R Lunch	1	0.3871	0.2142	3.2664	0.0707	1.473
College Prep	1	-0.7152	0.2667	7.1895	0.0073	0.489
Tech Prep	1	-0.4164	0.2532	2.7038	0.1001	0.659
Unclassified	1	0.5947	0.8752	0.4618	0.4968	1.813
BehSus	1	0.0513	0.00924	30.8434	<.0001	1.053
GPA	1	-1.0873	0.1930	31.7550	<.0001	0.337

n = 865

dropping out. Students with behavioral problems as reported by the number of

suspensions they accumulated during their education had a significantly higher

probability of dropping out of school than those with few or no behavioral problems after

controlling for all other variables in the model.

The age of a student was also found to be significant in relation to staying in

school. The analysis indicates that the older a student is, the higher probability of the

student dropping out before graduation, holding constant all other variables. Also of

significance was the program of study variable, students declaring a college preparatory

had a lower probability of dropping out of school than students declaring general studies

(the referenced group).

Predicted Probabilities. The association of predicted probabilities and observed

responses show the extent to which high probabilities are associated with dropping out

and low probabilities with staying in school. The *c* statistic, one of several measures of

association, is 0.85. This translates to 85% of all possible pairs of students with different

observed outcomes, one dropout and one non-dropout, the model correctly predicted a higher probability for those students who dropped out of school than the probability for those who stayed in school.

Goodness-of-Fit-Statistics. In assessing the goodness of fit of the model to the outcome of staying in school or dropping out, the results are as follows. The Hosmer-Lemeshow goodness-of-fit test yielded a $\chi^2 (8)$ of 14.0172 and was not significant with a value of p = .0813. This indicates the null hypothesis of good fit can not be rejected at the .05 level. Although not significant at the .05 level, the researcher felt compelled to investigate further the possibility of the interaction effects on the model.

To investigate the possibility of a "better model" being available, several interaction variables were introduced to the model. The goal is to see if adding the interaction variables will result in better fit as shown by Hosmer-Lemeshow test statistic and also to observe if the c statistic raises the predicted probability of the model.

The first investigation incorporated interactions of all statistically significant predictor variables, comprising the following: age*retention, age*behavior, age*GPA, retention*behavior, retention*GPA, and behavior*GPA. In the results of the model with the additional interaction predictors, the Hosmer-Lemeshow goodness-of-fit test yielded a $\chi^2 (8)$ of 8.1136 with a value of p = 0.4224, but many of the predictor variables were no longer statistically significant in the model. Eliminating the interaction predictors in order of non-significance resulted in a "best model" which incorporated two of the six interaction variables (retention*age, retention*behavior) and provided adequate goodness-of-fit with a yielded $\chi^2 (8)$ of 8.0989, p=0.4239, at the .05 significance level. The model fit was better and the predicted probability c statistic was slightly higher at

0.86, almost identical to the previous model which had no interaction predictors included

in the model (see Table 10).

Table 10

Logistic Analysis of Maximum Likelihood Estimates with Interaction Predictors

_____

Parameter /Predictor	DF	Coefficient Estimate (B)	Standard Error (B)	Wald Chi-Square	Pr > ChiSq
Intercept	1	-21.6944	5.1645	17.6459	<.0001
Age	1	1.2101	0.2816	18.4640	<.0001
Language	1	-0.1953	0.1904	1.0515	0.3052
Retention	1	18.1978	5.8195	9.7783	0.0018
F/R Lunch	1	0.3777	0.2156	3.0692	0.0798
College Prep	1	-0.7160	0.2685	7.1118	0.0077
Tech Prep	1	-0.4012	0.2540	2.4947	0.1142
Unclassified	1	0.8080	0.9172	0.7761	0.3783
BehSus	1	0.1001	0.0229	19.1142	<.0001
GPA	1	-0.9936	0.1953	25.8885	<.0001
Age*Retention	1	-0.8915	0.3221	7.6621	0.0056
Retention*Beh	1	-0.0604	0.0248	5.9523	0.0147

n = 865

Contrasting the results of the model in Table 9 and the model with interactions in

Table 10 reveals several observations. The predictor variables which were found to be of

significance in the model with no interaction variables were also found to be significant

in the more complex model which included two interactions. Specifically, the variables

which positively related to dropping out were the same in both models. These variables

were age, retention, and behavior. Contrasting the significant variables which were

negatively related to dropping out, these were also identical in both models. These

predictor variables were the college preparatory program of study and the student GPA.

It appears that the effects of retention are moderated by the age and behavior

variables. To explore these interactions Figure 1 was created to show the probability of

dropping out as a function of age for four groups (retained students with low behavior problems, where low was defined as 0 on the behavior scale which ranged from 0 to 70; retained students with high behavior problems, where high was defined as 50 on the 70 point scale; non retained students with low behavior problems; and non retained students with high behavior problems).

Figure 1. Probability of Dropping Out as a Function of Age (n=865)
Series 1 (Circles) are students not retained with low behavior problems.
Series 2 (Stars) are students not retained with high behavior problems.
Series 3 (Squares) are students retained with low behavior problems.
Series 4 (Triangles) are students retained with high behavior problems.

The previously discussed main effects can be seen in the graph of Figure 1. Namely retained students are more likely to drop out, as are older students, and students with behavior problems. Perusal of the graph also reveals the relative position of the non retained high behavior problem group changes at different ages. The probability of dropping out for this group increases with age at a greater rate than the other three

groups. At age 16 the effects of retention and behavior problems are both notable but by age 18 the effects of behavior seem much more pronounced than the effects of retention.

Another view of these results is to interpret the odds of dropping out for these students. As the graph in Figure 2 shows, as a student's behavior reports increase in numbers, it appears that the risk of dropping out for the student increases, and this general pattern exists whether a student is retained or not retained. For example, the odds of dropping out for a Hispanic/Latino male student at age 16, retained, and with high behavior problems is approximately 1.5 to 1, which steadily increases to 2.5 to 1 as they reach 18 years of age. By contrast, a 16 year old student not retained with high behavior problems has lower odds of approximately .5 but has a steeper climb and results in odds of approximately 7 to 1 of dropping out by the time a student is 18 years old. Also of note is the distance shown in the series at the three age levels. The groups are much wider at 18 years of age than at 16 years of age although again, the effects are nearly parallel for the retained groups as their odds of dropping out slightly increase with age. As with the probabilities, the odds of dropping out among Hispanic/Latino male students not retained with high behavior problems show a steeper and non parallel curve regarding behavior problems.
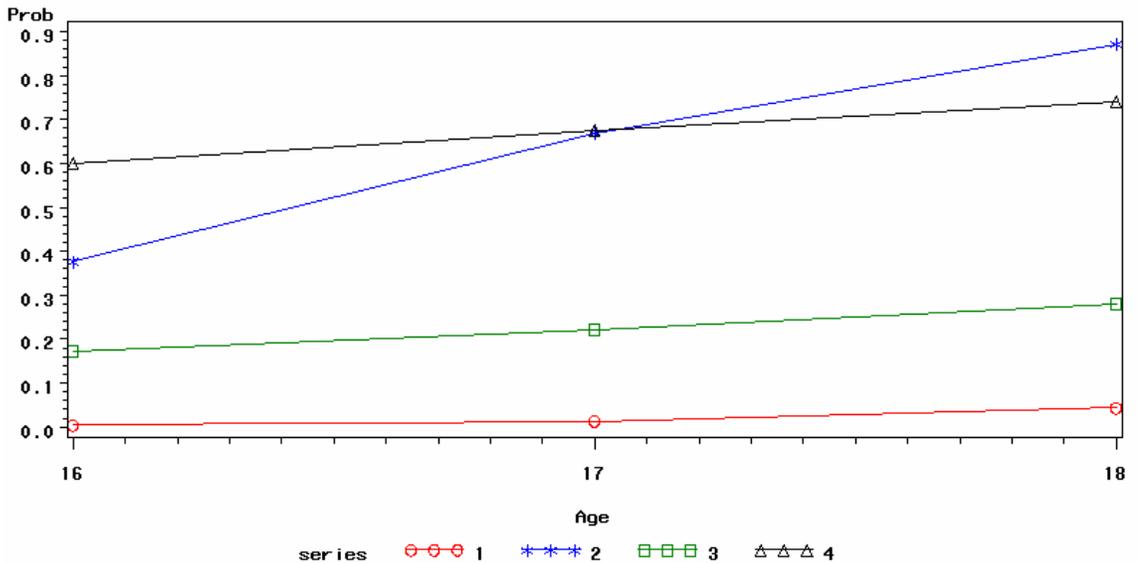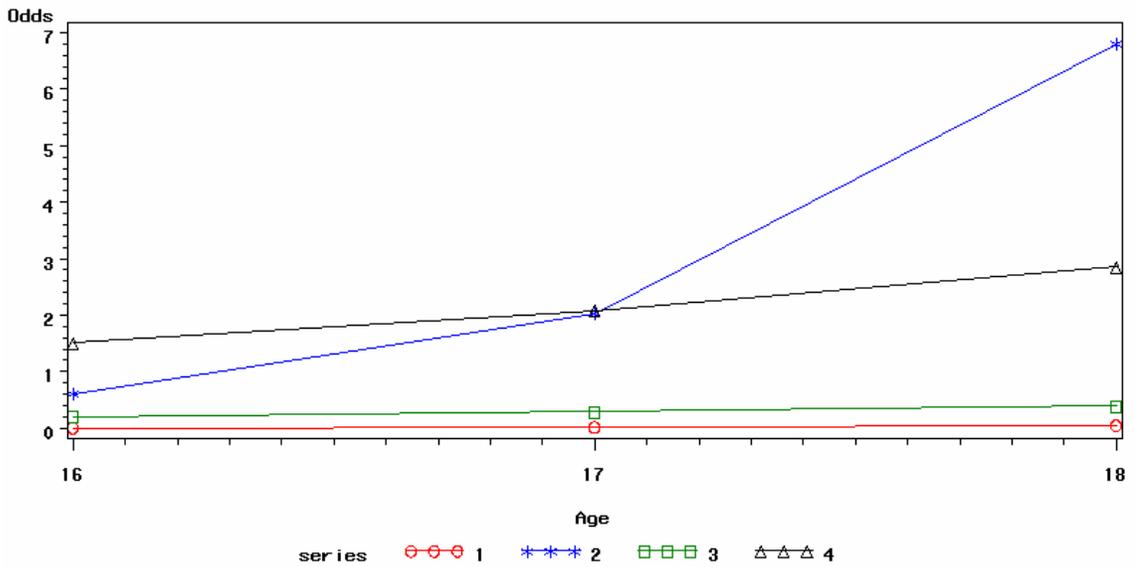
Figure 2. Odds of Dropping Out as a Function of Age (n=865)_____
Series 1 (Circles) are students not retained with low behavior problems.
Series 2 (Stars) are students not retained with high behavior problems.
Series 3 (Squares) are students retained with low behavior problems.
Series 4 (Triangles) are students retained with high behavior problems.

The behavior variable appears to have a strong effect on dropping out whether in the non

retained student group or the retained group. Because the investigation of possible

interactions was exploratory in nature, further investigation of the relationship among and

between these variables and the effect it has on dropping out of school is warranted.

Survival Analysis

The *DURATION* (time in days) variable was identified as days enrolled for each

year. To get a total for each individual in the sample, days enrolled for each year were

added for a sum total. Two other variables were available for possible analysis, days

present and days absent but it was the decision of the researcher to use days enrolled for the overall attendance dependant variable.

Of the six procedures that SAS software utilizes for survival analyses, this current study used the *lifetest* procedure as a starting point. The main portion of the research was completed using the *phreg* procedure which utilizes the proportional hazard model method of survival analysis. For each student in the sample, the duration variable (*DAYS* for this study) contained either the time the event of interest occurred (dropout) or, in censored cases, the last time the student was academically engaged (in school). This variable is the total sum of the days the student reported being enrolled for each year, 1995-96 through to 2000-01. A second variable (*STATUS)* indicates the status of the student at the time recorded in the *DAYS* variable. A widely used practice is to notate *STATUS=1* for uncensored individuals (dropouts) and *STATUS=0* for censored individuals. The data record also contains the values of the predictor variables: *AGE, LANGUAGE, RETENTION, FREE/REDUCED LUNCH, PROGSTU* (Program of study), *BEHSUS* (disciplinary suspensions), and *GPA*. This comprised the basic data structure for the survival analysis.

The LifeTest Procedure Using Kaplan-Meier Estimator

The *lifetest* procedure produces estimates of survival functions using two methods: the *Kaplan-Meier method* and the *life-table or actuarial method*. The K-M method is better suited for smaller data sets and precisely measured event times and the life-table method better for large data sets with event times measured crudely. As this data sample is fairly large and the event times measured precisely, and there are no

constricting criteria on the K-M method being used with large data sets, this method was utilized.

The Kaplan-Meier (KM) estimator (also known as the product limit estimator) is a popular method for estimating survival functions. The collected sample consisted of 1076 Hispanic/Latino male students. Since there are no predictor variables in this analysis, the entire sample was used in calculating survival functions. Since previous analyses used the sample consisting of 865 students, survival function estimates were calculated for this sample also. Due to the similar estimates in both, the sample consisting of 865 students were reported.

Using the *lifetest* procedure, SAS produced the following results: at 78 days, which would coincide with approximately half a year of enrollment, the observation was censored, the KM survival estimate is undefined. At 181 days, which would coincide with approximately one year of enrollment, the KM survival estimate is .9965. This means that the probability a student will survive for 180 days or more is estimated to be .9965 (see Table 11). The year and a half mark is approximately 272 days and the probability of survival KM estimate is .9834. At 362 days, approximately two years of enrollment, the probability of surviving this far or beyond KM estimate is .9565.

Taking this same pattern of looking at the KM estimates for the remaining years at half yearly intervals, the following probabilities are produced. At 452 days, approximately two and a half school years, the KM survival estimate is .9075. Continuing with the next event time with an uncensored observation close to the three-year total of 541 produced a KM survival estimate of .8606 at 541 days. At the three and a half year mark, approximately 631 days, the KM estimate is .7964. Year 4 showed an estimated

probability of .7249 at 720 days, and at four and a half years a KM estimate of .6626 at approximately 810 days. Year 5 translated to approximately 899 days, the standard graduation time for this cohort produced a KM estimate of .5998. As can be seen in Table 10, this is the point in time that the risk set decreases from 348 students to 30 students due to graduation. The last several survival functions need to be interpreted with the knowledge that the sample now includes a small number of students in the risk set. The last dropout occurred at 1076 days with a survival estimated at .1131. At 1082 days, the largest censoring time, the KM estimate is undefined.

The next statistic to report is Failure, which is just 1 minus the KM estimate. This is the estimated probability of dropping out prior to the specified time. At 122 days or approximately half a year, the estimated probability of dropping out is about .00116; at 181 days, approximately one year of enrollment, it is .00351, less than one percent. At 272 days, which coincides with approximately one and a half year of enrollment, the failure statistic is .0166; at 362 days, the two year enrollment, it is .0435. At 452 days, coinciding with the two and a half year of enrollment point, the failure statistic is 0.0925; at 541 days, approximately three years of enrollment, it is .1394. Three and a half years of enrollment is at approximately 631 days and the failure statistic is .2036; at 720 days, the four year enrollment, it is .2751. At 810 days, approximately half way through this cohort's senior year in high school, the failure statistic is .3374; at 899 days, the standard graduation time, it is .4002; and at 1076 days, the last recorded dropout time, it is .8869.

82

Table 11

Estimates of Survival Function using the Lifetest Procedure and Kaplan-Meier Method.
_____

		Product-Limit Survival Estimates			
			Non-Dropout		
Days	Non-		Standard	Dropout	Risk
Enrolled	Dropout	Dropout	Error	Number	Set
0.00	1.0000	0	0	0	865
78.00*	.	.	.	0	864
122.00	0.9988	0.00116	0.00116	1	861
179.00	0.9977	0.00233	0.00165	2	851
180.00*	.	.	.	2	850
181.00	0.9965	0.00351	0.00202	3	848
203.00	0.9941	0.00586	0.00261	5	844
272.00	0.9834	0.0166	0.00440	14	820
325.00	0.9676	0.0324	0.00613	27	794
360.00*	.	.	.	35	767
362.00	0.9565	0.0435	0.00710	36	757
410.00	0.9361	0.0639	0.00858	52	726
450.00*	.	.	.	73	690
452.00	0.9075	0.0925	0.0103	74	689
540.00	.	.	.	108	614
541.00	0.8606	0.1394	0.0124	109	613
570.00	0.8380	0.1620	0.0133	125	593
630.00*	.	.	.	153	550
631.00	0.7964	0.2036	0.0147	154	549
720.00	0.7249	0.2751	0.0166	202	451
741.00	0.7053	0.2947	0.0171	214	423
760.00	0.6950	0.3050	0.0174	220	402
777.00	0.6827	0.3173	0.0177	227	387
794.00	0.6755	0.3245	0.0179	231	372
810.00	0.6626	0.3374	0.0182	238	348
899.00	0.5998	0.4002	0.0272	259	30
900.00*	.	.	.	259	28
903.00	0.5758	0.4242	0.0351	260	24
1013.00	0.3393	0.6607	0.0821	266	6
1053.00*	.	.	.	266	3
1070.00	0.2262	0.7738	0.1074	267	2
1076.00	0.1131	0.8869	0.0963	268	1
1082.00*	.	.	.	268	0

n = 865   NOTE: The marked* survival (non-dropout) times are censored observations. Estimated probability (dropout) of dropping out, prior to the specified time.

   In Figure 3, the estimates of the Kaplan-Meier survival function are plotted. As

seen in the diagram, it is near the end of the student's education (close to graduation) that

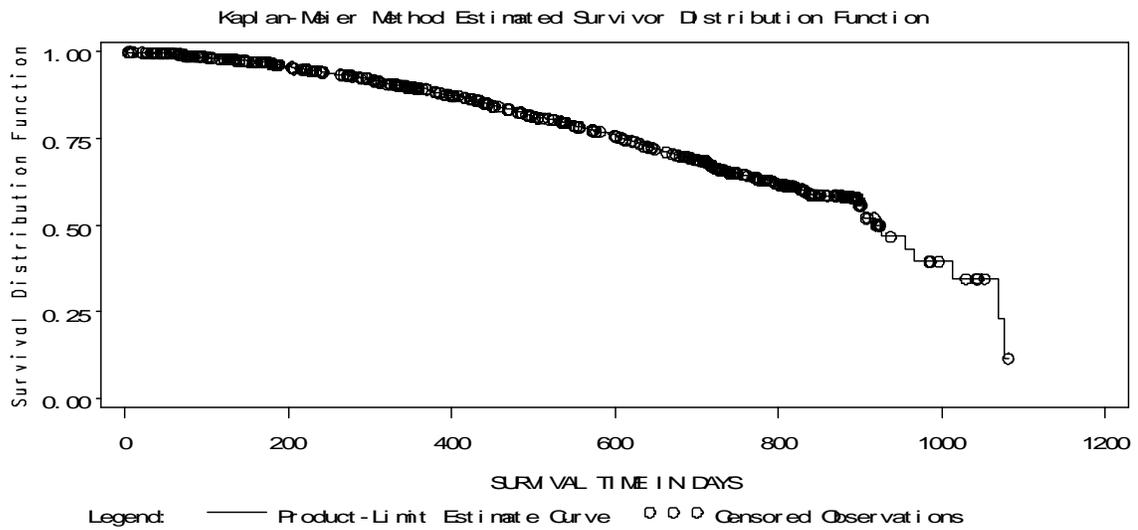events most affect their school completion.

Figure 3. Estimates/Plot of Survival Function using the K-M Method (n=865)

Univariate Categorical Predictor Analysis, Testing for Differences

The next analysis reported is a univariate analysis on the variables of interest. For the categorical variables, it is recommended that one graphs and looks at the Kaplan-Meier curves for each of the groups. This will show the shape of the survival function for each of the groups and tell whether or not the groups have proportional hazards. This helps in determining whether there is a difference between levels of categorical predictors.

Language. Does language have any effect on the survival experience of this student population? To test the null hypothesis that there is no difference between the language groups, the Mantel-Haenszel Test (also known as the log-rank test) was calculated. Interpretation of the log-rank test of equality across strata resulted in no

84

differences found. The obtained Chi-square value for the predictor variable *Language* was not statistically significant, χ^2 (1)= 0.03, p= .86, at the .05 significance level.

The similarity in the survival function for the 2 language groups [English coded 0, Spanish coded 1] can be seen in the graph (see Figure 4). The survival function are almost identical except for at the very beginning and at the very end of the study time.

Survival Function for Language group Testing for Differences
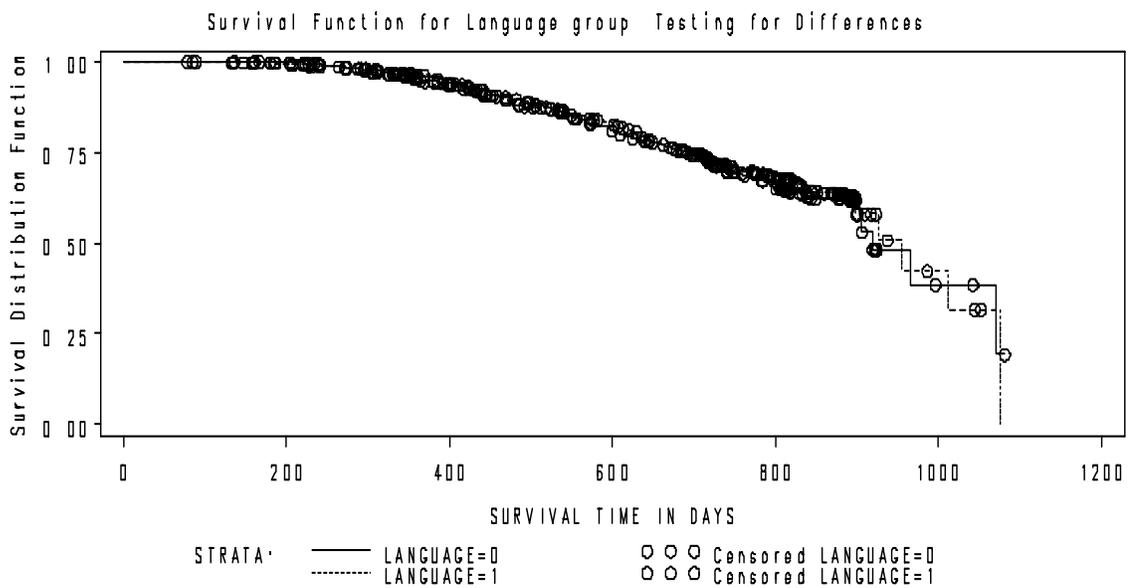
Figure 4. Language Differences in the Survival Function (n=865)

Retention. In addressing the question of whether retaining a student at any point between eighth and twelfth grade had an effect on staying in school, statistical significance was found. The chi-square value for the log-rank test of equality across strata statistic was statistically significant, χ^2 (1)=190.83, p<.0001. This indicates student retention negatively affected the student's overall probability of remaining in school until graduation.

85

The graph of the survival function of each group of *Retention* (see Figure 5) displays survival curves that overlap at the beginning and then diverge for the remainder of the study. These separate and distinct paths of this variable may suggest some violation of the proportional hazards assumption. The consequences of this may be problematic in later analysis since proportionality is an assumption in the Proportional Hazards Model. An approach to address this possible violation will be further explained in the *Proportionality Assumption* section.

Figure 5 represent the visual plots of survival functions testing for differences in the *retention* predictor groups [Not-retained code 0, Retained coded 1]. Students who

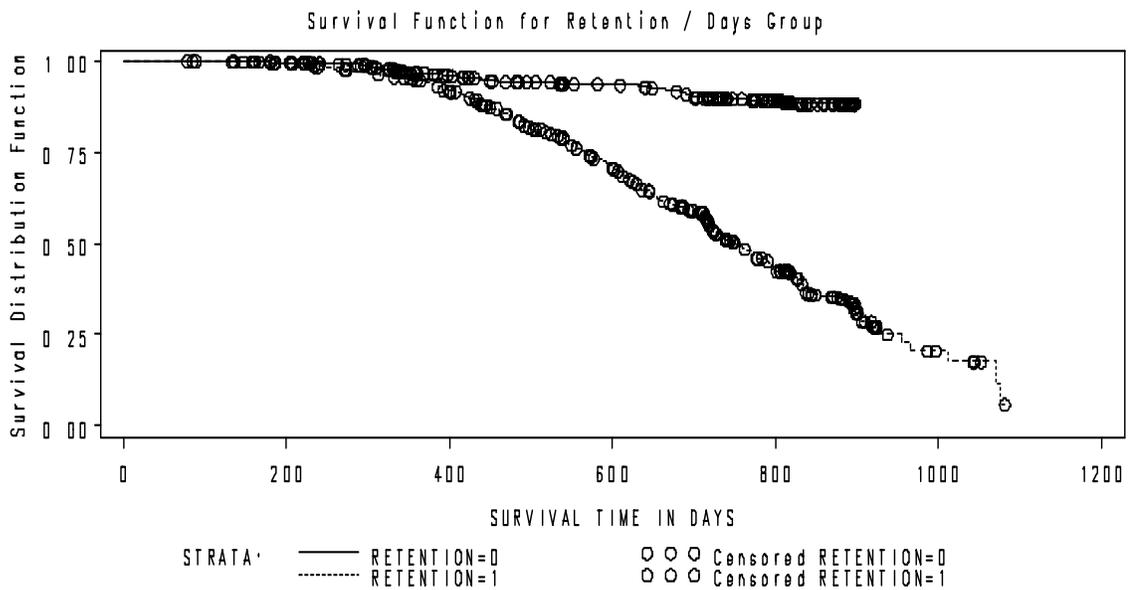Survival Function for Retention / Days Group

Figure 5. Retention Differences in the Survival Function (n=865)

had been retained at some point in their education had a higher probability of dropping out than students who had not been retained during their educational experience.

86

F/R Lunch. The next predictor variable *free/reduced lunch,* was also significant.

There seems to be a significant effect on staying in school or dropping out whether the students participate or do not participate in the free/reduced lunch program. The chi-square value for the log-rank test of equality across strata statistic was statistically significant, χ^2 (1)=4.08, p=.04, at the .05 level. This indicates student's participation affected the student's overall probability of remaining in school until graduation.

The survival curves for the two groups of the *free/reduced lunch* predictor (see Figure 6), shows an overlap in the beginning of the study but then separate out to somewhat proportional curves for the remainder of the study [Non-free lunch coded 0, Free lunch coded 1] .
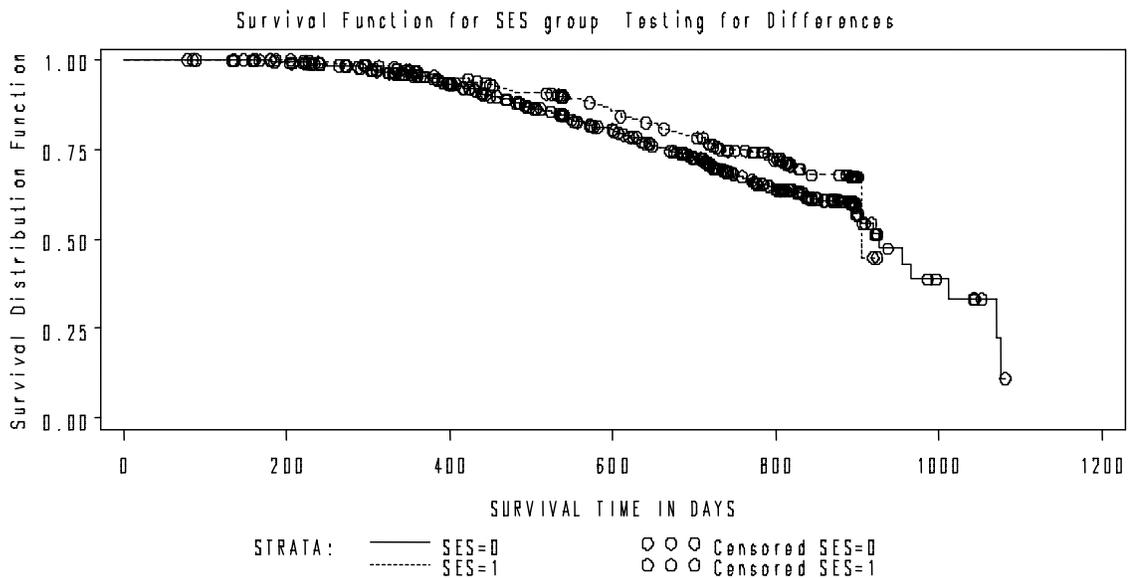

Figure 6. F/R Lunch Differences for the Survival Function (n=865)

The proportionality assumption proportional hazards appears to have been met in this variable.

Program of Study. The program of study predictor variable was also significant. There seems to be a significant effect on staying in school or dropping out whether the students have decided on their long term educational goals. In this analysis, the chi-square value for the log-rank test statistic was statistically significant, $\chi^2 (3)=119.27$, p<.0001, at the .05 level. This indicates student's chosen program of study affected the student's overall probability of remaining in school or dropping out.

The graph of the survival curves (see Figure 7) shows that three of the four groups are somewhat proportional although one group (Unclassified) stands out with a distinct survival curve. Of the predictor variables analyzed thus far, along with retention, this one has shown the second greatest effect.
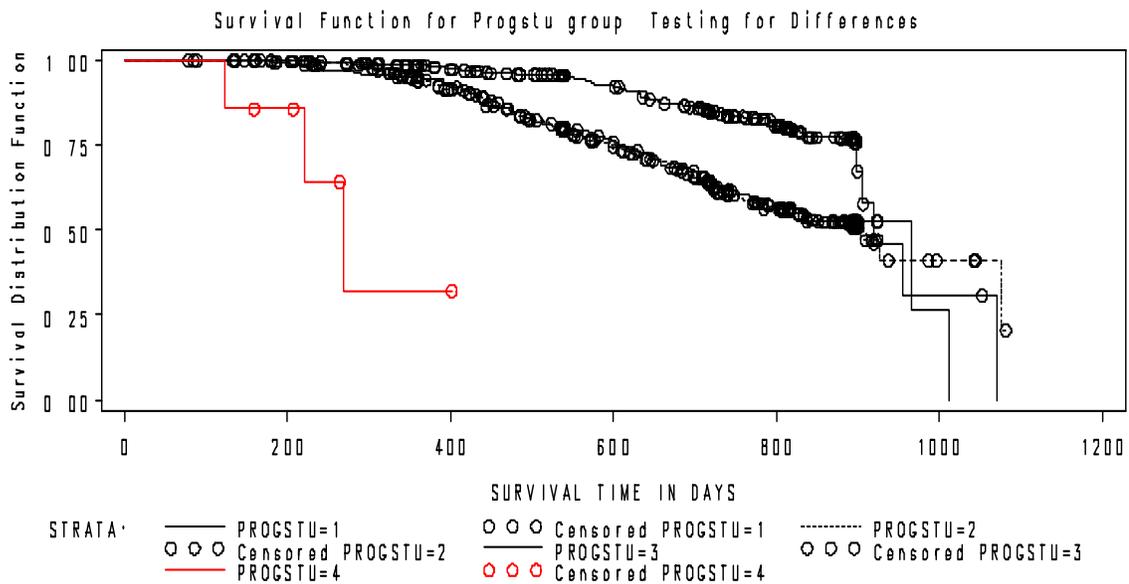

Figure 7. Program of Study Differences for the Survival Function (n=865)

Proportional Hazards Model Testing

The prediction model will now be analyzed with the goal of obtaining a model relating to dropping out of school for Hispanic/Latino male students. The model to be tested is one in which all the continuous and dummy coded categorical variables (age, language, retention, free/reduced lunch, college preparatory, technical preparatory, unclassified program, behavior, and GPA) are entered simultaneously as predictors.

Main Effects Analysis

The next analysis is the model's main effects (see Table 12). The age predictor variable is significant with a p-value of <.0001, holding all other variables constant. The retention variable, is also significant with a p-value of <.0001. The program of study predictor variable identifying college preparatory educational goal, is significant with a p-value of .0016. The program of study variable identifying those students choosing a technical preparatory educational goal, is also significant with a p-value of .0201. The program of study variable identifying those students not having been classified with an educational goal, is significant with a p-value of <.0001. The next predictor variable of significance is behavior, and it has a p-value of <.0001 and the achievement predictor variable GPA is also significant at the p-value of <.0001.

Further interpretation of Table 12 focused on the hazard ratios. This can be interpreted for dichotomous variables as the ratio of the estimated hazard for those with a value of 1 to the estimated hazard of those with a value of 0, holding constant all other covariates. It can be interpreted for a continuous variable as the ratio of the estimated hazard for those one unit higher on the predictor relative to those one unit lower on the

predictor. Looking at the *age* predictor, as a student's age increases by one unit, and the

remaining variables are held constant, the hazard rate of dropping out approximately

Table 12

Analysis of the Model's Main Effects using the Cox Proportional Hazards Model

_____

<u>Analysis of Maximum Likelihood Estimates</u>

Vars	DF	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq	Hazard Ratio
Age	1	0.72080	0.09716	55.0377	<.0001	2.056
Language	1	-0.17400	0.12793	1.8498	0.1738	0.840
Reten	1	0.01672	0.19079	28.3987	<.0001	2.764
F/R Lunch	1	0.19157	0.14275	1.8008	0.1796	1.211
Col Prep	1	-0.57194	0.18073	10.0147	0.0016	0.564
TechPrep	1	-0.37144	0.15985	5.3993	0.0201	0.690
Unclass	1	4.13108	0.65158	40.1963	<.0001	62.245
BehSus	1	0.01925	0.00487	15.6064	<.0001	1.019
GPA	1	-1.42672	0.15324	86.6775	<.0001	0.240

n = 865

doubles. Regarding *retention*, for those students having been retained, while holding all

the other variables constant, the hazard rate of dropping out was approximately two to

three times greater than staying in school (i.e., it increased by 276.4%). For the program

of study predictor, *college preparatory*, holding all other variables constant, those

students who chose a college preparatory program, their hazard rate of dropping out was

approximately half as likely as those in the general program of studies (referenced

group), hazard ratio = .567 For the program of study technical preparatory, holding all

other variables constant, the hazard rate of dropping out was approximately two-thirds as

likely as the general program of study (referenced group), hazard ratio = .69. The

behavior predictor, holding all others constant, as the students' behavior disciplinary

reports increased by one unit (on a 70 point scale), the hazard rate of dropping out

increased by 2.0%. Finally, looking at the predictor *GPA*, the model indicates that as a student's GPA decreases by one unit, and the remaining variables in the model are held constant, the hazard rate of Hispanic/Latino male students dropping out of school was approximately four times as great. In other words, as GPA increases by one unit the hazard rate was reduced to about one quarter of what it was.

Proportionality Assumption

To verify that the model satisfies the assumption of proportionality, the following analysis checks proportionality by including time-dependent covariates in the model. These time dependent covariates are the interactions of the predictor variables with time. Interpretation of the proportionality test resulted in significance of one time dependent covariate, as well as the covariates collectively. The collectively obtained Chi-square value was statistically significant, χ^2 (9)= 27.94, p<.0001. Due to this significance, the assumption of proportionality has not been satisfied. Testing the individual variables as time dependent covariates resulted in retention*days being significant with a p-value of <.0001. The remaining time dependent covariates were not significant with p-values greater than .05 as shown in Table 13.

Table 13

Proportionality Assumptions Testing using the Cox Proportional Hazards Model
_____

Analysis of Maximum Likelihood Estimates

Vars	DF	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq	Hazard Ratio
Age	1	0.74313	0.09822	57.2419	<.0001	2.103
Language	1	-1.20395	2.20747	0.2975	0.5855	0.300
Reten	1	-11.77982	2.67346	19.4147	<.0001	0.000
F/R Lunch	1	-2.34047	2.70220	0.7502	0.3864	0.096
CollPrep	1	-4.14494	3.61647	1.3136	0.2517	0.016
TechPrep	1	3.03332	2.85112	1.1319	0.2874	20.766
Unclass	1	13.10893	13.77387	0.9058	0.3412	493330.5
BehSus	1	-0.02041	0.00483	17.9155	<.0001	1.021
GPA	1	-1.34986	0.15366	77.1731	<.0001	0.259
Lang_D	1	0.16594	0.35007	0.2247	0.6355	1.180
RET_D	1	2.04268	0.43010	22.5555	<.0001	7.711
SES_D	1	0.40665	0.42770	0.9040	0.3417	1.502
CollP_D	1	0.55631	0.56902	0.9558	0.3282	1.744
TechP_D	1	-0.54431	0.45413	1.4366	0.2307	0.580
Uncls_D	1	-1.66230	2.55390	0.4237	0.5151	0.190

n = 865

A solution to a non-proportional predictor is to stratify on the predictor with a new model. This fits separate models for each level of retention, specifically, having been retained or never been retained. The model is under the constraint that the coefficients are equal but the baseline hazard functions are not equal. Running this analysis resulted in the results shown in Table 14. Note this includes all predictors but retention. The parameter estimates for these predictors are almost identical to the values presented in Table 12, and thus the interpretation of the effects of those variables on dropout remains the same. Since the parameter estimates are almost identical to those in the model with retention as a proportional predictor, it can be concluded that it is not necessary to stratify on the predictor.

Table 14

Non-Proportionality Testing by Stratifying on the Retention Predictor (n=865)

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<u>Analysis of Maximum Likelihood Estimates</u>

Vars	DF	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq	Hazard Ratio
Age	1	0.72658	0.09757	55.4555	<.0001	2.068
Language	1	-0.17151	0.12811	1.7924	0.1806	0.842
F/R Lunch	1	0.22052	0.14300	2.3780	0.1231	1.247
ProgS1	1	-0.57196	0.18091	9.9952	0.0016	0.564
ProgS2	1	-0.38147	0.15983	5.6964	0.0170	0.683
ProgS4	1	4.03335	0.67148	36.0797	<.0001	56.450
BehSus	1	0.01942	0.00483	16.1914	<.0001	1.020
GPA	1	-1.36567	0.14908	83.9134	<.0001	0.255

To further elaborate on the effects of retention, a graph was used to illustrate the effects. Results of the retention predictor show the cumulative hazard of the retained group appears to rise at an increasing rate (see Figure 8). As time advances, the hazard risk of students dropping out of school is growing greater whereas the risk of students never retained increases at a constant and lower rate.
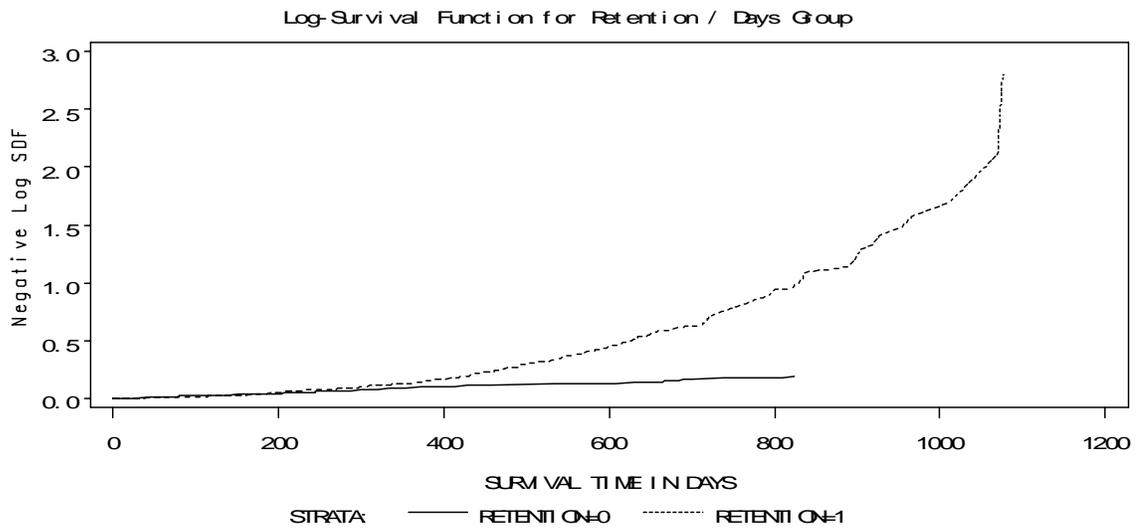
Figure 8. Cumulative Hazard Function for Retention.

Summary and Conclusion

The first section described the sample of Hispanic/Latino male students.

Descriptive statistics on the predictor variables and the dependent variable were reported.

In section two, a logistic regression analysis was performed and results interpreted. As

stated earlier, significance was found in several of the predictor variables. Of the seven

variables of interest in the research, all but language and free/reduced lunch were found

to have a significant effect on whether Hispanic/Latino male students dropped out of

school or completed their education and graduated. The effects on a student dropping out

of school is positively related to a student's retention history, positively related to a

student's behavior by suspension, positively related to a student's age, negatively related

to GPA, and negatively related to the college preparatory program of study.

94

Section three described and reported on survival analysis using the proportional hazard model method. There was significance in five of the seven variables in the analysis using the SAS Language phreg procedure. The only variables that were not statistically significant (p>.05) were the language predictor and the free/reduced lunch predictor variables. In the survival analysis using the proportional hazards method, the event of interest, dropping out of school, was positively related to a student's age, positively related to a student's retention history and, positively related to a student's behavior by suspension. Dropping out of school for this cohort of Hispanic/Latino male students was negatively related to GPA, and negatively related to the college preparatory program of study. The results from the analyses will be discussed in the following chapter.

Chapter Five

Discussion

Many empirical studies on high school dropout rates among minorities focus overwhelmingly on the same types of factors. These include characteristics of students and their families, such as, socioeconomic status, marital status of parents, education level of parents, immigration status, and number of siblings. Further, many of these studies use the same national longitudinal data sets (e.g., Alspaugh, 1998; Natriello, 1986; Rumberger & Larson, 1998; Rumberger, 1987). This is advantageous on one hand but it also has its downside. On the positive side, these studies have established patterns across time, but looking at only national data can obscure possible local trends. For instance, high school dropout rates among students in Florida could be offset by lower dropout rates in Connecticut.

General Findings

General findings are organized in terms of the following research questions:

1. What is the relation between age, home language, retention history, free/reduced lunch, program of studies, behavior (disciplinary suspensions), reading achievement, mathematics achievement, and GPA and dropping out of secondary school by Hispanic/Latino males?

2. At what grade levels do the predictor variables begin to affect the male Hispanic/ Latino students' propensity for early school leaving? When are they at greatest risk?

96

First, this research found that approximately 31% of this Hispanic/Latino male sample dropped out prior to completing their high school education during the 5-year span. This is slightly higher than the national reported average of Hispanic/Latino dropouts of 27% for both genders but much higher than the national average of 12.3% for all dropouts (Census Bureau, 2002). The most hazardous time for these students is well into their secondary education, very close to when they would actually graduate, during their junior to senior years. It may be the time close to their eighteenth birthday that lets them legally choose to leave school that triggers this hazardous time period.

The significance of the age predictor in this study reinforces the research of Shu (1988) which also found that the older the student, the higher probability of dropping out of school. Although language was not significantly related to time to dropout, significance was reported in the retention variable at the .0001 alpha level. This is consistent with the findings of the Latino Coalition's (2000) study revealing that students had a higher probability of leaving school if they were identified as having been retained in grade. This is not just a Hispanic/Latino male phenomenon. It is well documented that retention is an influence on students' ability and desires to continue with their academic life (Rumberger & Thomas, 2000; Rumberger, 1995).

The free/reduced lunch predictor in this study was comprised of whether a student was receiving free-lunch assistance or not part of this financial assistance. Here as in the language predictor, there was no significance found in how this variable related to dropping out or staying in school. Although Rumberger (1995) and others have found significance in the socioeconomic variable, it may have been the categorical method of identifying SES for this study (free lunch) that produced the discrepant finding.

97

To investigate the choices students make regarding their educational plans in high school, this group of Hispanic/Latino males was divided into four categories. These categories were college preparatory, technical preparatory, general education, and those students who were not specified (unclassified). After creating dummy variables for this categorical variable, with general education as the referenced group, the results were significant. This study found significance in choosing college preparatory, as it related to general education. Hispanic/Latino male students declaring a college preparatory program of study were the group less likely to drop out of school. Significance was also found in choosing a technical preparatory program of study as it related to general education. This group was also less likely to drop out of school than the general education group. With the unclassified group, students which had not declared any program of study, although also significant, it was negatively related to dropping out as it related to the referenced group. Students in the unclassified group were more likely to drop out of school. These findings are consistent with the finding of Alexander et al. (1997) who found that track placement was an extremely important predictor of dropout.

This study looked at suspensions as a predictor in the model and found it also to be significant. As students' reported disciplinary problems increased, their likelihood of dropping out also increased at a significant level. Kramer (1998) examined dropout causes among race-ethnic and gender groups. The finding of the research coincide with the findings of the present analysis in that males reported school disciplinary problems, academics, and economics as the main reasons they dropped out of school. In the Aviles, Guerrero, Howard, and Thomas (1999) study, attendance was one of several problematic

areas reported by students who had dropped out of school, coinciding with the results of the present study.

The achievement variable for the study, GPA, was also found to be significant in predicting whether Hispanic/Latino males dropped out of school or stayed in school. The findings in this research agree with the findings of Fernandez, Paulson, and Hirano-Nakanishi (1989) who in their investigation of *non*-Hispanic whites, Blacks, and Hispanics by gender reported grades as a strong predictor of dropping out for all three groups. Rumberger and Thomas (200) suggested that changes in school policies and a focus on academic performance would decrease the dropout rate in their study of the NELS 88 school effectiveness study data.

In addressing the time element of the research, it was found that the greatest risk of dropping out occurred at approximately the eleventh grade. This period coincides with the student turning of age at which a student may drop out willingly. It is also the period that work may begin to play a larger role in a student's responsibility to either family or personal relationships.

Statistical Methods Comparison

Both methods, the logistic regression and the proportional hazards model found statistical significance in identifying predictors of Hispanic/Latino male dropouts (see Table 15). Logistic regression analysis found age, retention, suspension, GPA, and college preparatory of the program variable to be statistically significant. Neither the technical preparation nor the unclassified program of study groups were found to be of statistical significance.

The proportional hazards model also found age, retention, suspension, GPA, and college preparatory to be statistically significant. In addition to finding statistical significance in the identical predictors found in the logistic regression, the proportional hazard analysis also found the technical preparation and the unclassified group to be statistically significant. It appears the proportional hazards model approach was more sensitive in detecting relationships in its calculations.

Table 15

Comparative of Logistic Analysis and Survival Analysis

Parameter /Predictor	DF	Logistic Regression Pr > ChiSq	Odds Ratio	Survival Analysis Pr > ChiSq	Hazard Ratio
Age	1	<.0001	1.763	<.0001	2.056
Language	1	0.3517	0.838	0.1738	0.840
Retention	1	<.0001	5.565	<.0001	2.764
F/R Lunch	1	0.0707	1.473	0.1796	1.211
Coll Prep	1	0.0073	0.489	0.0016	0.564
Tech Prep	1	0.1001	0.659	0.0201	0.690
Unclass	1	0.4968	1.813	<.0001	62.245
BehSus	1	<.0001	1.053	<.0001	1.019
GPA	1	<.0001	0.337	<.0001	0.240

n = 865

Conclusions

Students' age, retention history, behavior problems, program of study, and GPA are important factors in predicting whether students drop out of school. Although at the present time, and for several previous decades, holding a student back and having the student repeat a grade they had difficulty in completing has been the standard practice, this solution may be an area of educational practices that needs to be revisited.

Age, retention, behavior, program of study, and GPA all seem to have an effect on whether a student decides to stay in school or drop out of school. This research found

evidence that individually, these variable are important in investigating factors related to student dropout and it also found that the retention effect is somewhat moderated by the age of the student and their behavior as reported by disciplinary problems. More attention may need to be focused on such variables as we assess and evaluate how students are performing in school to better assist them and keep them from dropping out. The findings of this longitudinal analysis of factors affecting dropping out of school among Hispanic/Latino males will hopefully assist in coming up with remedies to this national problem.

Limitations of the Study

This study focused only on one school district. Most student data are reported by schools and collected by districts. There are several other limitations of this study which follow. First, due to the various definitions of variables and statistical computations used by districts, the results may not be generalizable beyond this school district and may in fact be unique to this school district (Hammack, 1986; Ekstrom, Goertz, Pollack, & Rock, 1986). Second, the variables examined are those which the school district uses for identification and academic performance purposes. Although some interesting relationships among certain variables would have been advantageous to this research to investigate (e.g., methods of instruction, peer group interactions, intervention programs) it was not possible to obtain such data. According to Morrow (1986), there is no standard system for data collection and keeping track of students moving among schools or leaving the state. Many students who have dropped out of school show up as having left the district or state and there is no way to confirm what has actually happened to these "missing" students.

A third area of concern to the present research is the operational definition of the socio economic status predictor variable. A more precise description of the family and their socio economic status may have had a more pronounced effect had it been better defined and with several categories. Although using meal program participation as a dichotomous predictor as was used in this study can be informative, limitations were present in the study. Another limitation to the study was that it did not look at barriers or access to education issues for students. Barriers such as inadequate school/district funding along with applying a holistic accommodation process instead of considering individual circumstances need to also be investigated. Factors looking at students that refuse to or are unable to assimilate could also shed light on the dropping out problem. Access to the better performing schools is also worth a look to identify successful approaches to graduation.

Lastly, since data collection and data entry involve many people, human error is likely somewhere along the process. Therefore, unless one collects and enters all data personally, which would not automatically eliminate all errors, data quality may itself be a limitation.

Future Research

Additional studies would be helpful to confirm some of the findings in the present investigation. The present study used a correlational approach and replicating this research may result in added evidence to these findings. Replication studies on other schools from different districts may be looked at and time frames may be lengthened or shortened depending on research queries of interest. A continuation of this study may be comprised of comparing local data to other locales in the state. This study focused on one

school district's student level factors of demographics and achievement, future research could include school level factors such as classes within schools, schools within districts, and districts within states for a more complex and thorough investigation. Also, having collected longitudinal data at the student, class, local district, and state levels, multi-level statistical models may be applied to ascertain best fit and investigate those predictors solely and in combination having the largest effect on dropouts. This could lead to further study of including both male and female Hispanic/Latino students. In addition, future studies could include all students by ethnicity for a better understanding of student dropout.

To further the study of the dropout phenomena, all factors mentioned may be investigated using more complex statistical analyses such as hierarchical linear modeling (HLM) and structural equation modeling (SEM). Also available are mixed methods approaches, a combination of qualitative and quantitative approaches, for a more robust description of the factors associated with students dropping out of school.

One possible avenue to explore could be a more effective representation of the socio economic status (SES) predictor. This variable has been found to be a significant predictor of dropping out of school by several researchers (Alspaugh, 1998; Reyes, Gillock, Kobus, & Sanchez, 2000; Rumberger & Larson, 1998; Rumberger, 1995). As this variable is widely used in educational research, a more comprehensive operational definition would be helpful in identifying its effects with more precision.

In addition, state level data may be investigated in relation to other states and aggregated national data that may be available. Lastly, the dropout phenomena of all our

students across our Nation needs to be addressed as we enter into the 21ˢᵗ century

requiring competition for job and resources on a global level.

This study reports the condition of Hispanic/Latino male dropouts at the local

level with data from one school district in the state of Florida. The population of males in

eighth grade in 1995 was followed for 5 years to analyze their academic experience. Only

a small number of variables were used in this survival analysis that included age,

language, retention, free/reduced lunch, program of studies, behavior, and GPA.

Expanding on this research should include other empirically significant variables as well

as interaction effects of various combinations. More complex models are required and a

deeper investigation of all factors that play a part in students' academic lives should be

investigated.

Recommendations

In this study, the variables of interest were those that a school district already had

available. This limitation extends to an obvious recommendation to expand on the type of

data collected by districts for future use in research. Continuing this thought would be to

expand on the length of time used in the longitudinal approach to the study. Results from

the study showed that it may be much earlier than middle school and high school that the

problems of at risk students may be beginning to develop. Although the problems may

start earlier, it manifests itself in 11ᵗʰ and 12ᵗʰ grade. It may very well be that 5 years

worth of data is not enough to pinpoint problematic periods in students' lives for a better

understanding of the dropout phenomenon.

Although there is much discussion on both sides of the issue for the instituting of

national standards, it would at least give researchers the opportunity of looking at how

the nation is doing educationally. Presently there is such variation in high school graduation requirements from state to state that it is difficult to get a clear picture not only of graduates but also of dropouts. The phrase "comparing apples to oranges" comes to mind but it is exactly what researchers are being asked to do in attempting to find solutions to the ever increasing number of dropouts across the United States. More research is needed on what keeps students in school and motivates their learning in addition to what causes others to leave school. Solutions for the long term are necessary. They may be more difficult to implement but if chosen correctly, they may/will be the ones to produce the desired effects.

Involvement in their children's education by parents is a must for the academic success of students, especially those having difficulty due to the various factors that have been explored in this research (Pong & Dong-Beom, 2000; Peterson, 1996). Educators also need to be aware that these students are experiencing a rough time in the process of getting an education. The concept of empathy, although easy to understand is much more difficult to implement in the everyday classroom. In this specific instance, we need to reach out to the Hispanic/Latino communities if there is to be success in the education of Hispanic/Latino students. In reaching all of the students having difficulty with completing their education, we need to reach out to learn the reasons why they are deciding to drop out of school instead of graduating and taking advantage of the new opportunities that are now available to them.

The NCES data on the current condition of dropouts report approximately 11% of the students in the United States drop of school before graduating (NCES, 2003). The picture was fairly even when the issue of gender was investigated. Although males seem

to dropout at a slightly higher rate than females, there was no discernable difference. When looking at the ethnicity breakdown, the alarming trend of Latinos disproportionately having such a large dropout percentage should not be overlooked.

High school dropout survival rates naturally carry over to higher education opportunities. The U.S. Census of 1997 reported that 28% of people between the ages of 25 and 29 had completed a bachelor's degree, while only 11% of Latinos had managed the same (Driscoll, 1999). In 2002, Hispanic/Latinos of this age group comprised 19.3% of the population with 10.3% completing a bachelor's degree (NCES, 2003). If we can increase the numbers of Hispanic/Latino youth staying in high school, we may likely see a decrease in other social problems, such as poverty and crime, and an increase in employment prospects and earning potential. To this end, this research is aimed at contributing to the empirical knowledge base of the Hispanic/Latino dropout phenomenon.

References

Alexander, K. L., Entwisle, D. R. & Horsey, C. S. (1997). From first grade
forward: Early foundations of high school dropout. *Sociology of Education, 70,*
(2), 87-107.

Allison, P. D. (1995). *Survival Analysis Using the SAS System: A Practical Guide.*
Cary, NC: SAS Institute Inc.

Alspaugh, J. W. (1998). The relationship of school and community characteristics to
high school dropout rates. *The Clearing House, 71,* (3), 184-188.

American Association of University Women (2001, March). Troubling label for
Hispanics: Girls most likely to drop out. *Migration World Magazine, 29,* 3, 13.

Anderson, S, Auquier, A., Hauck, W.W., Oakes, D., Vandaele, W., & Weisberg, H. I.
(1980). *Statistical methods for comparative studies.* New York, NY: John Wiley
& Sons.

Aviles, R. M., Guerrero, M. P., Howarth, H. B., & Thomas, G. (1999). Perceptions of
Chicano/Latino students who have dropped out of school. *Journal of Counseling
and Development, 77,* (4), 465-474.

Barro, S. (1984). *The Incidence of Dropping Out*: *A Descriptive Analysis*. Washington,
D.C.: Economic Research, Inc.

Barro, S. & Kolstad, A. (1987). *Who drops out of high school? Findings from high
school and beyond.* Washington, DC: U.S. Department of Education, National
Center for Education Statistics.

Battin-Pearson, Sara, Abbott, Robert D., Hill, Karl G., Catalano, Richard F., Hawkins, J.
David, & Newcomb, Michael D. (2000). Predictors of Early High School
Dropout: A Test of Five Theories. *Journal of Educational Psychology, 92,* (3),
568–582.

Blyth, D.A., Simmons, R.G., & Canton-Ford, S. (1983). The adjustment of early
adolescents to school transitions. *Journal of Early Adolescence, 3,* 105-120.

Carter, D. L. (1983). Hispanic interaction with the criminal justice system in Texas:
Experiences, attitudes and perceptions. *Journal of Criminal Justice, 11,* 213-227.

Chiricos, T. G. (1987). Rates of crime and unemployment: An analysis of aggregate research evidence. *Social Problems, 34*, (2), 187-212.

Cope, R. & Hannah, W. (1975). *Revolving college doors: The causes and consequences of dropping out, stopping out and transferring*. New York, NY: John Wiley & Sons.

Denson, K. & Schumacker, R. (1996). Student choices: Using a competing risks model of survival analysis. Unpublished paper. (ERIC Document Reproduction Service No. ED 399 341.

DesJardins, S. L. & Moye, M. J. (2000). Studying the timing of student departure from college. Unpublished paper. (ERIC Document Reproduction Service No. ED 445 650.

Driscoll, A. K. (1999). Risk of high school dropout among immigrant and native Hispanic youth. *The International Migration Review, 33*, (4), 857-875.

Eccles, J.S. & Midgely, C. (1998). Stage/environment fit: Developmentally appropriate classrooms for young adolescents. In R.E. Ames and C. Ames (Eds), Research on motivation in education. New York: Academic Press.

Ekstrom, R. B., Goertz, M. E., Pollack, J. M., & Rock, D. A. (1986). Who drops out of high school and why? Findings from a national study. *Teachers College Record, 87*,3, 356-373.

Entwisle, D. R. & Alexander, K. L. (1989). Early schooling as a 'critical period' phenomenon. Pp. 27-55 in *Research in Sociology of Education and Socialization*, edited by N. Krishnan Namboodiri and Ronald G. Corwin. Greenwich, CT: JAI Press.

Fernandez, R. M., Paulsen, R., & Hirano-Nakanishi, M. (1989). Dropping out among Hispanic youth. *Social Science Research, 18*, 21-52.

Fine, M. (1991). *Framing Dropouts: Notes on the Politics of an Urban Public High School.* Albany, NY: State University of New York Press.

Freeman, R. B. (1996). Why so many young American men commit crimes and what might we do about it? *Journal of Economic Perspectives, 10*, (1), 25-33.

Good, T. (1987). Two decades of research on teacher expectations: Findings and future directions. *Journal of Teacher Education,* July-August, 32-47.

Graham, S., Hudley, C., & Taylor, A. Z. (1998). Exploring achievement values among ethnic minority early adolescents. *Journal of Educational Psychology, 90*, (4), 606-620.

Griffin, B. W. (2002). Academic disidentification, race, and high school dropouts. *The High School Journal,* April-May, 71-81.

Hall, R. E. & Rowan, G. T. (2001). Hispanic-American males in higher education: A descriptive/qualitative analysis. *Education, 121*, *3*, 565-574.

Hammack, F. M. (1986). Large school systems' dropout reports: An analysis of definitions, procedures, and findings. *Teachers College Record, 87*,3, 324-341.

Hebert, T. P. & Reis, S. M. (1999). Culturally diverse high-achieving students in an urban high school. *Urban Education, 34*, (4), 428-457.

Hess, R.S. & R.C. D'Amato (1996). High school completion among Mexican-American children: Individual and family background variables. *School Psychology Quarterly, 11*, (4), 353-368.

Hougaard, P. (2000). *Analysis of Multivariate Survival Data.* New York, NY: Springer-Verlag.

Jarjoura, G.R. (1996). The conditional effect of social class on the dropout-delinquency relationship. *Journal of Research in Crime and Delinquency, 33*, 232-256.

Johnson, J. (1989, September 15). Hispanic dropout rate is put at 35%. The New York Times, p. 12.

Jordon, W. J., Lara, J., & McPartland, J. M. (1996). Exploring the causes of early dropouts among race-ethnic and gender groups. *Youth and Society, 28,* (1), 62-94.

Kitchen, R.S. & Velasquez, D. T. (2000). *Dropouts in New Mexico: Native Americans and Hispanic Students Speak out*. Paper presented at the annual meeting of the American Educational Research Association, April 2000, New Orleans, Louisiana.

Koshal, R. K., Koshal, M., & Marino, B. (1995). High school dropouts: A case of negatively sloping supply and positively sloping demand curves. *Applied Economics, 27,* 75-82.

Kramer, J. A. (1998). Exploring High School Dropout Causes and Educational Re-engagement Among Race Ethnic and Gender Groups. Dissertation, California State University, Long Beach.

Kronick, R. F. & Hargis, C. H. (1998). *Dropouts: Who drops out and why-And the recommended action* (2nd ed.). Springfield, Illinois: Charles C. Thomas, Publisher, LTD.

Latino Coalition, (Nov. 2000). *They are our kids: Findings from the Latino dropout study*. The Children's Board of Hillsborough County, University of South Florida.

McKissack, F. L. (1998). Cyberghetto: Blacks are falling through the net. *The Progressive, 65,* (6), 84-87.

Miller, R. G. (1981). *Survival Analysis.* New York, NY: John Wiley & Sons.

McGlynn, A. P. (2001). Hispanic girls most likely to drop out...and stay out: Mixed messages and discrepant expectations faulted. *Hispanic Outlook in Higher Education, 12*, 1, 30.

Morrow, G. (1986). Standardizing practice in the analysis of school dropouts. *Teachers College Record, 87*,3, 342-355.

Natriello, G. (1998). Failing Grades for Retention. *The School Administrator*, August, 14-17.

Natriello, G., McDill, E. L., & Pallas, A. M. (1990). *Schooling disadvantaged children: Racing against catastrophe*. New York: Teachers College Press.

Natriello, G., ed. (1986). *School dropouts: Patterns and Policies.* New York: Teachers College Press.

Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. (1996). *Applied Linear Regression Models.* Chicago, Il: Irwin.

Office of Educational Research and Improvement (1993). *Reaching the goals. Goal 2: High school completion.* Washington, DC: OERI. (ERIC Document Reproduction Service Report No. ED 365 471.

Ogbu, J. U. (1992). Understanding cultural diversity and learning. *Educational Researcher, 21*, (8), 5-14.

Ogbu, J. U. (1987). Variability in minority school performance: A problem in search of an explanation. *Anthropology and Education Quarterly, 18*, 312-334.

Osborne, J. W. (1997). Race and academic disidentification. *Journal of Educational Psychology, 89*, (4), 728-735.

Peterson, R. (1996). A re-evaluation of the economic consequences of divorce. *American Sociological Review, 61*, 528-536.

Pittman, R. B. (1991). Social factors, enrollment in vocational / technical courses, and high school dropout rates. *Journal of Educational Research, 84,* (5), 288-295.

Pittman, R. B. and Haughwoult, P. (1987). Influence of high school size on dropout rate. *Educational Evaluation and Policy Analysis, 9,* (4), 337-353.

Pong, S. L. & Dong-Beom, J. (2000). The effects of change in family structure and income on dropping out of middle and high school. *Journal of Family Issues, 21*, (2), 147-169.

Raffaele, L. M. (Feb. 2000). *An analysis of out-of-school suspensions in Hillsborough County*. Children's Board of Hillsborough County, University of South Florida.

Reyes, O., Gillock, K. L., Kobus, K. & Sanchez, B. (2000). A longitudinal examination of the transition into senior high school for adolescents from urban, low-income status, and predominantly minority backgrounds.*American Journal of Community Psychology*, 28, (4), 519-544.

Roderick, M. (1994). Grade retention and school dropout: Investigating the association. *American Educational Research Journal,* 31, (4), 729-759.

Ronco, S. L. (1994). *Meandering ways: Studying student stopout with survival analysis.* Paper presented at the Annual Forum of the Association for Institutional Research, New Orleans, La, May 29 – June 1, 1994.

Rosenfeld, L. B., Richman, J. M., & Bowen, G. L. (1998). Supportive communication and school outcomes for academically 'at-risk' and other low income middle school students. *Communication Education, 47,* (4), 309-325.

Rosenthal, R. & Jacobson, L. (1968). *Pygmalion in the classroom: Teacher expectations and pupils intellectual development.* New York: Holt, Rinehart and Winston.

Rumberger, R. W. (1987). High school dropouts: A review of issues and evidence. *Review of Educational Research, 57*, 101-121.

Rumberger, R. (1995). Dropping out of middle school: A multilevel analysis of students and schools. *American Educational Research Journal, 32*, (3), 583-625.

Rumberger, R. W. & Larson, K. A. (1998). Student mobility and the increased risk of high school dropout. *American Journal of Education, 107*, 1-35.

Rumberger, R. W. & Thomas, S. L. (2000). The distribution of dropout and turnover rates among urban and suburban high schools. *Sociology of Education, 73*, (1), 39-67.

Sattin, G. A. & Somnath, D. (2001). The Kaplan-Meier estimator as an inverse-probability-of-censoring weighted average. The American Statistician, 55, (3), 207-210.

Schumacker, R. E. & Denson, K. B. (1994). *Interpreting significant discrete-time periods in survival analysis*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, La., April 4-8, 1994.

Shu, G. J. (1988). The Determinants of Dropping Out of High Schools for Cuban Americans, Mexican Americans and Puerto Ricans. Dissertation, University of Wisconsin-Milwaukee.

Seidman, E., Aber, J. L., Allen, L., & French, S. E. (1996). The impact of the transition to high school on the self-esteem and perceived social context of poor, urban youth. *American Journal of Community Psychology, 24*, 409-515.

Staman, E. M. (1979). Predicting Student Attrition at an Urban College. Dissertation, The College of William and Mary in Virginia.

Steele, C. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist, 52*, 613-629.

Tinto, V. (1982). Limits of theory and practice in student attrition. *Journal of Higher Education, 53*, (6), 687-700.

United States Department of Education (1998). *No More Excuses*: *The Final Report Of the Hispanic Dropout Project.* Washington, DC.

United States Bureau of the Census (2001). *Current population survey, March 2000.* Washington D.C.: Government Printing Office.

United States Bureau of the Census (2000). *Statistical Abstract of the United States.* Washington, DC: U.S Government Printing Office.

U.S. Department of Education (2003). National Center for Education Statistics. *Projections of Education Statistics to 2013.* NCES 2004 – 013, by Debra E. Gerald and William J. Hussar. Washington, DC: 2003.

U.S. Department of Education (2003). National Center for Education Statistics. *Status and Trends in the Education of Hispanics.* NCES 2003 – 008, by Charmaine Llagas. Project Officer: Thomas D. Snyder. Washington, DC: 2003.

U.S. Department of Education (2001). National Center for Education Statistics. *Dropout Rates in the United States: 2000.* NCES 2002 – 114, by Phillip Kaufman, Martha Naomi Alt, and Christopher D. Chapman. Washington, DC: 2001.

U.S. Department of Education (2001). National Center for Education Statistics. *Dropout rates in the United States:1999.* Retrieved June 28, 2001, from http://nces.gov/pubs2001.htm

U.S. Department of Education (2000). National Center for Education Statistics. *Information on public schools and school districts.* Retrieved September 14, 2001 from http://ed.gov/ccd/

U.S. Department of Education (2000). National Center for Education Statistics. *Key indicators of Hispanic student achievement: National goals and benchmarks for the next decade* [on-line]*.* Available: http://ed.gov.pubs/hispanicindicators/

Varlede, S. A. (1987). A comparative study of Hispanic high school dropouts and graduates: Why do some leave school early and some finish? *Education and Urban Society, 19,* (3), 320-329.

Velez, W. & Saenz, R. (2001). Toward a comprehensive model of the school leaving process among Latinos. *School Psychology Quarterly, 16,* (4), 445-467.

Willet, J. B. & Singer, J. D. (1995). It's déjà vu all over again: Using multiple- spell discrete-time survival analysis. *Journal of Educational and Behavioral Statistics, 20*, (1), 41-67.

Willet, J. B. & Singer, J. D. (1988). *Doing data analysis with proportional hazards models: Model building, interpretation and diagnosis.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, La, April 5-9, 1988.

Winglee, M. (2000). A recommended approach to providing high school dropout and completion rates at the state level. *Technical report,* National Center for Education Statistics, January 2000. NCES 2000-305.

Appendices

Appendix A: Withdrawal Codes Available and Frequencies

Frequency:

DNE – Any PK-12 student who was expected to attend a school but did not enter as expected for unknown reasons

617 W01 – Any PK-12 student promoted or transferred to another attendance reporting unit in the same school

164 W02 – Any PK-12 student promoted or transferred to another school in the same district

W2A – Any student who was withdrawn following an expulsion hearing resulting in a change of placement in lieu of expulsion

113 W03 – Any PK –12 student who withdraws to attend another public school in or out-of-state

7 W04 - Any PK –12 student who withdraws to attend a non-public school in or out-of-state

4 W05 – Any student over compulsory attendance age who leaves school voluntarily with no intention of returning

376 W06 – Any student who graduated from school with a standard diploma

2 W07 – Any student who graduated from school with a special diploma based on option one-mastery of student performance standards

1 W08 – Any student who left school with a certificate of completion

W09 – Any student who left school with a special certificate of completion

W10 – Any student who left school with a State of Florida High School Diploma (GED)

W11 – Any PD-12 student withdrawn from school due to hardship

1 W12 – Any PK-12 student withdrawn from school due to death

2 W13 – Any PK-12 student withdrawn from school due to court action

W14 – Any student who withdraws from school to enter the military

98   W15 – Any PK – 12 student who is withdrawn form school due to nonattendance

W16 – Any student who withdraws from school to get married

W17 – Any student who withdraws from school due to pregnancy

W18 – Any student who withdraws due to medical reasons

W19 – Any student who is withdrawn from school because exceptional student education programs are unavailable due to the student's age

W20 – Any student who withdraws from school due to failing the Statewide Student Assessment Test, Parts I or II, and who does not receive any of the certificates of completion

19   W21 – Any student who is withdrawn from the rolls due to being expelled from school

36   W22 – Any PK – 12 student whose whereabouts is unknown

W23 – Any PK – 12 student who withdraws from school for any reason other than those given above

7   W24 – Any PK – 12 student who withdraws from school to attend a home education program

W25 – Any PK – 12 student who withdraws from school who is under compulsory attendance age

111   W26 – Any student who leaves to enter the Adult Program within the district prior to completion of graduation requirements

Appendix B: ESE Codes Available and Frequencies

Frequency:

13   2010 - Educable Mentally Handicapped (EMH)

3   2020 - Trainable Mentally Handicapped (TMH)

3   2030 - Severe / Profoundly Mentally Handicapped (SPMH)

        2031 - Traumatic Brain Injury

        2032 - Other Health Injury

        2038 - Hospital Group – DU

        2039 - Hospital Group

2   2040 - Physical Therapy

3   2041 - Occupational Therapy

92   2050 - Speech Impaired Part-Time

1   2051 - Language Impaired Part-Time

        2052 - Hearing Impaired Part-Time

        2060 - Speech Impaired Full-Time

        2061 - Language Impaired Full-Time

        2062 - Hearing Impaired Full-Time

        2068 - Established Condition

        2069 - Developmentally Delayed

        2070 - Visually Handicapped Part-Time

        2080 - Visually Handicapped Full-Time

32   2090 - Emotionally Handicapped Part-Time

29   2100 - Emotionally Handicapped Full-Time

     2101 - Emotionally Handicapped Modified Day

85   2110 - Specific Learning Disabilities Part-Time

45   2120 - Specific Learning Disabilities Full-Time

     2121 - Specific Learning Disabilities Modified Day

     2122 - Language Learning Disabilities Full-Time

58   2130 - Gifted Part-Time

3   2140 - Hospital / Homebound Part-Time

     2143 - Hospital / Homebound Tel 1-1

     2144 - Hospital / Homebound Tel l-2

     2148 - Hospital / Homebound PT Dual Enrolled

     2150 - Profound Health Care

14   2151 - Severely Emotionally Disabled

     2152 - Multiple Handicaps - Hard-of-Hearing & Blind

     2153 - Autistic

About the Author

Dorian Charles Vizcain received a Bachelor's Degree in Music - Performing Arts from New Jersey City University in 1979 and a Master's Degree in Education from the University of South Florida in 1995. Since entering the Ph.D. program at the University of South Florida in 1995, he has taught measurement and statistics courses to undergraduates at all USF campuses and Hillsborough Community College.

While in the Ph.D. program at the University of South Florida, he coauthored and published in the *Florida Journal of Educational Research*. Dr. Vizcain investigated numerous educational research problems as a member of research teams and solo projects. The results of these papers were presented at annual research conferences that included, the Florida Educational Research Association (FERA), the Eastern Educational Research Association (EERA), Association for General and Liberal Studies (AGLS), American Anthropological Association (AAA), and, the American Educational Research Association (AERA).