Degree attainment of low-socioeconomic status students: structural equation modeling test of an elaborated theory of socialization

Kevin Patrick Saunders
_Iowa State University_

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Degree attainment of low-socioeconomic status students: 
Structural equation modeling test of an elaborated theory of socialization

by

Kevin Patrick Saunders

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Major: Education (Educational Leadership)

Program of Study Committee:
John Schuh, Major Professor
Stephen Aigner
Nancy Evans
Daniel Robinson
Mack Shelley

Iowa State University
Ames, Iowa
2004
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Major Professor

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# TABLE OF CONTENTS

LIST OF FIGURES  
LIST OF TABLES  
ACKNOWLEDGEMENTS  

<table>
<thead>
<tr>
<th>CHAPTER 1. INTRODUCTION</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and Research Questions</td>
<td>3</td>
</tr>
<tr>
<td>Rationale</td>
<td>4</td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td>5</td>
</tr>
<tr>
<td>Significance of the Study</td>
<td>12</td>
</tr>
<tr>
<td>Assumptions</td>
<td>14</td>
</tr>
<tr>
<td>General Limitations</td>
<td>16</td>
</tr>
<tr>
<td>Definitions</td>
<td>17</td>
</tr>
<tr>
<td>Summary</td>
<td>18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 2. LITERATURE REVIEW</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Attainment Overview</td>
<td>21</td>
</tr>
<tr>
<td>Social Reproduction</td>
<td>23</td>
</tr>
<tr>
<td>Socialization Perspective</td>
<td>29</td>
</tr>
<tr>
<td>Economic Perspective</td>
<td>39</td>
</tr>
<tr>
<td>Interactionalist Perspective</td>
<td>49</td>
</tr>
<tr>
<td>Summary</td>
<td>58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 3. METHODOLOGY</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodological Approach</td>
<td>60</td>
</tr>
<tr>
<td>Methods</td>
<td>65</td>
</tr>
<tr>
<td>Data Analysis Procedures</td>
<td>72</td>
</tr>
<tr>
<td>Design Issues</td>
<td>76</td>
</tr>
<tr>
<td>Limitations</td>
<td>80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 4. DATA ANALYSES AND RESULTS</th>
<th>82</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive Analysis</td>
<td>82</td>
</tr>
<tr>
<td>Structural Equation Model</td>
<td>84</td>
</tr>
<tr>
<td>Analyses of Research Questions</td>
<td>90</td>
</tr>
</tbody>
</table>
CHAPTER 5. SUMMARY AND IMPLICATIONS 108
Review of the Study 108
Degree Attainment Process 109
Implications for Theory and Research 125
Implications for Practice 130
Summary 139

APPENDIX A. Variable Definitions 141

APPENDIX B. Correlations Among Endogenous Variables 147

APPENDIX C. Additional Goodness-of-Fit Statistics 149

REFERENCES 151
LIST OF FIGURES

Figure 2.1. A Socialization Model of Educational Attainment 31
Figure 2.2. Causal Model of Financial Aid and Persistence 48
Figure 2.3. General Interactionalist Model 53
Figure 3.1. Proposed Causal Model of Degree Attainment 63
Figure 4.1. Revised Causal Model of Degree Attainment 86
Figure 4.2. Final Structural Model 101
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table Number</th>
<th>Table Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Sample Demographic Information</td>
<td>69</td>
</tr>
<tr>
<td>4.1</td>
<td>Means and Standard Deviations for All Variables in the Model</td>
<td>83</td>
</tr>
<tr>
<td>4.2</td>
<td>Comparison of Goodness-of-Fit Indices Across Models</td>
<td>89</td>
</tr>
<tr>
<td>4.3</td>
<td>Significant Total Effect Coefficients of Parents' Education and Income on Endogenous Variables</td>
<td>93</td>
</tr>
<tr>
<td>4.4</td>
<td>Significant Total Effect Coefficients of Exogenous and Endogenous Variables Related to Education Aspirations</td>
<td>96</td>
</tr>
<tr>
<td>4.5</td>
<td>Significant Total Effect Coefficients of Exogenous and Endogenous Variables Related to Academic and Social Integration</td>
<td>100</td>
</tr>
<tr>
<td>4.6</td>
<td>Significant Total Effect Coefficients of Predictor Variables for Degree Attainment</td>
<td>104</td>
</tr>
<tr>
<td>4.7</td>
<td>Significant Unstandardized Total Effect Coefficients for the Final Structural Model</td>
<td>105</td>
</tr>
<tr>
<td>4.8</td>
<td>Standardized Direct Effect Coefficients, Model Odds Ratios, and Logistic Regression Odds Ratios of Predictor Variables for Degree Attainment</td>
<td>107</td>
</tr>
</tbody>
</table>
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CHAPTER 1
INTRODUCTION

Institutions of higher education, policy makers, and the public increasingly are concerned about the accessibility and affordability of higher education for low-socioeconomic status (SES) students. Society values equality of educational opportunity and looks to higher education to ensure access to lower-SES students (College Board, 1999; Terenzini, Cabrera, & Bernal, 2001). Low-SES students, however, face several barriers that can hamper their ability to complete this critical level of education. Before students begin postsecondary education, socioeconomic factors influence students’ predisposition to attend college, search for potential institutions, and choice among institutions. For example, SES influences the likelihood that parents talk to their children about college (Stage & Hossler, 1989), the level of parental encouragement (Cabrera & La Nasa, 2000; McDonough, 1997), and the formation of postsecondary plans (Cabrera & La Nasa; King, 1996a; Trusty, 2000).

When searching for possible institutions to attend, low-SES students have fewer information sources about college (Tierney, 1980) and less knowledge of financial aid availability and qualification criteria (Olson & Rosenfeld, 1984). As students make choices among institutions, low-SES students are more sensitive to college costs and availability of financial aid (U.S. Department of Education, 2003).

For students who overcome these pre-entry barriers, enrollment in colleges and universities provides exposure to multiple cognitive and academic development experiences. However, low-SES students continue to face barriers to degree attainment. One of the most significant differences between low- and high-SES students is in their preparedness for college study. Terenzini et al. (2001) noted sharp contrasts in the academic achievement of
high school seniors in the areas of reading, math, science, and social studies across SES quartiles. Other research indicates a relationship between the level of high school curricula students complete and factors such as family background and socioeconomic status (Adelman, 1999; Horn & Kojaku, 2001).

The ability of low-socioeconomic status students to overcome these multiple barriers and earn a baccalaureate degree is an important issue when considering equality of access to educational opportunities and status attainment. Pascarella and Terenzini (1991) described the dual role of educational attainment. First, educational attainment mediates the influence of an individual’s background characteristics on subsequent income and occupation. Second, it directly relates to status attainment. Pascarella and Terenzini stated, “...completing the bachelor’s degree may be the single most important educational step in the occupational and economic attainment process” (p. 529). However, baccalaureate degree achievement rates are not uniform across socioeconomic levels. For example, in a study of students who entered four-year institutions in 1989-90, Berkner, Cuccaro-Alamin, and McCormick (1996) found that 81% of students in the highest-SES quartile had earned a credential or were still enrolled five years later, compared to only 51% of students in the lowest-SES quartile.

The influence of SES on students’ educational expectations and support can serve to reinforce students’ current status, promoting a form of social and economic reproduction in which low-SES students are unable to reach higher levels of occupational status and income. The processes that facilitate low-SES students’ achievement of educational goals, such as earning a baccalaureate degree, merit further research. As Terenzini et al. (2001) explained, “...a clear understanding of how Americans of underprivileged socioeconomic backgrounds develop aspirations to attend college, ready themselves for college work, choose among
institutions, and enroll and persist to graduation has eluded researchers and policymakers alike” (p. 1).

It is clear that low-SES poses enduring barriers to students’ baccalaureate degree attainment. Several models have been proposed to explain students’ degree attainment in higher education, including socialization models, economic models, and interactionalist models. The socialization model places aspirations as a central element in the status attainment process and positions aspirations as shaped through students’ socioeconomic background, educational experiences, and social interactions (Kerckhoff, 1976). Economic models of education attainment emphasize the importance of individual finances and financial aid (e.g., Cabrera, Nora, & Castañeda, 1992; St. John, 1990). Finally, interactionalist models explore the “dynamic reciprocal interaction between [institutional] environments and individuals” (Tinto, 1986, p. 366), usually in efforts to explain student departure decisions.

Few studies, however, provide an integrated understanding of how these factors interact to affect degree attainment for low-SES students. Terenzini et al. (2001) described the research on the degree attainment process for low-SES students as “atomistic,” noting that the available research tends to consider separate phases of the college entrance and attainment process and often fails to integrate empirical findings with theory and policy analysis.

Purpose and Research Questions

The purpose of this study is to develop an integrated understanding of how social, economic, and interactional factors affect degree attainment for low-SES students. Examining these factors using status attainment theory could provide an important analytic
framework for learning more about the interaction among multiple factors that influence the educational outcomes of low-SES students.

While researchers have used multiple models to examine educational outcome processes, additional research is necessary to explore how the social, economic, and institutional experiences of low-SES students individually and collectively influence degree attainment. The following research questions guide this study:

1. How does low SES influence baccalaureate degree attainment?
2. How do low-SES students’ degree aspirations influence baccalaureate degree attainment?
3. How does financial aid affect the degree attainment of low-SES students?
4. How does social and academic integration influence low-SES students’ baccalaureate degree attainment?
5. How do SES, degree aspirations, financial resources, academic integration, and social integration interact to influence degree attainment for low-SES students?

Rationale

The examination of student retention and degree attainment continues to be a topic studied widely within higher education. Recognizing that social class has not received adequate attention in the study of student retention and degree attainment (Berger, 2000), it is important to examine the major forces that shape low-SES students’ degree aspirations and pursuit of college degrees. In addition, it seems appropriate to look for different ways to understand how social, economic, and environmental factors interact to affect degree attainment for low-SES students. By examining the preceding research questions, I seek to integrate information regarding students’ background characteristics, including educational expectations and parental education level, economic resources, and institutional experiences
such as academic integration and social integration. Using this approach, I seek to examine the dynamic interaction of multiple factors in an effort to understand degree attainment of low-SES students.

Theoretical Framework

One theoretical framework used to explore differences in educational attainment is a status attainment perspective that examines how students' interactions with parents, teachers, peers, and significant others socialize them to the value of achievement and appropriate educational goals (Carter, 2002). In general, status attainment models explore how social mobility is a function of family social status, individual ability, and intervening experiences (Blau & Duncan, 1967; Sewell & Hauser, 1975). In the context of education, status attainment models explore how SES, students' early academic performance, and social interaction (parents, peers, teachers) influence the formation of students' degree aspirations (Carter). Initial degree aspirations continue to interact with social status, academic performance, and social experiences in ways that influence the degree attainment process (Hanson, 1994; Sewell, Haller, & Portes, 1969).

Higher education studies that employ the status attainment model largely have concentrated on the beginning stages of the college entrance process as a way to explore the impact of an individual's social status on educational aspirations and equality of access to institutions (e.g., Hearn, 1984; McDonough, 1988). The status attainment framework also offers insights into the degree attainment process as a continuum throughout an individual's lifetime. Similar to Terenzini et al. (2001), this research follows a conceptual framework that posits students' baccalaureate degree attainment as a multiple-stage, longitudinal process. As students navigate the stages of forming degree aspirations, choosing a college, enrolling at an
institution, and attaining a degree, it is important to note that context, social class, and family support continue to shape the degree attainment process (e.g., Aschaffenburg & Maas, 1997; DiMaggio & Mohr, 1985; Hossler, Schmit, & Vesper, 1999; Sewell et al., 1969).

While status attainment is a well-established theoretical framework for studying educational aspirations and degree attainment, Bourdieu’s (1977) theory of social reproduction offers an additional conceptual framework for explaining inequities in educational attainment related to social class. The concept of social reproduction focuses on understanding how stratified social systems of hierarchy and domination reproduce intergenerationally (Carter, 2002). This perspective may offer a better understanding of how access to, and manipulation of, capital resources affects baccalaureate degree attainment for low-SES students. The consideration of status attainment models through the context of social reproduction offers a lens that permits examination of how SES influences students’ educational opportunities, impacts access to social milieus where education is valued, and shapes students’ experiences of institutional environments.

**Status Attainment Perspectives in Higher Education**

In efforts to study the forces that shape student departure and degree attainment, previous research has offered multiple ways of thinking about and explaining the various stages of the educational process. Depending upon the specific theory used, researchers highlight different aspects of the educational process and emphasize various social phenomena. The following is a brief overview of socialization, economic, and interactionalist theoretical frameworks that contribute to the understanding of status attainment in the context of education. While other theoretical perspectives also have offered insights into educational attainment (e.g., organizational, psychological), this study concentrates on selected
theoretical perspectives that examine the impact of external social and economic forces on the degree attainment process (Tinto, 1986). Rather than explore individual student (psychological) or immediate institutional (organizational) characteristics, this research uses socialization, economic, and interactional perspectives to examine broader social phenomena that directly or indirectly shape educational processes for low-SES students.

**Socialization perspective.** Sociological perspectives offer ways to understand status attainment in general, and educational attainment in particular. Studies using the socialization perspective often focus on the impact of sociodemographic variables such as family education, status, income, and previous academic achievement. Studies representing the socialization perspective offer clear evidence that sociodemographic variables have a strong impact on degree completion (DiMaggio & Mohr, 1985; McDonough, 1994). This perspective looks at degree attainment not as an isolated event, but as a part of a greater process of social stratification that preserves existing patterns of social and educational inequality (Tinto, 1986). Pascarella and Terenzini (1991) explained the importance of socialization models of status attainment by stating, “These models are theoretically important because they suggest a new approach to the understanding of social mobility; they view social mobility as a process of status attainment that develops over the life cycle” (p. 369).

**Economic perspective.** Economic theories emphasize the importance of individual finances and financial aid in enabling educational attainment. Regarding the collegiate experiences of low-SES students, a majority of the research considers the role of financial factors. Many of these studies explore the utility of financial aid in equalizing educational opportunities for students in need of financial assistance (Astin, 1975; St. John, Andrieu,
Oescher, & Starkey, 1994) or the influence of economic factors on educational outcomes (e.g., Cabrera et al., 1992; St. John, Paulsen, & Starkey, 1996). Because this study focuses on low-SES students, financial influences on baccalaureate degree attainment are particularly relevant.

*Interactional perspective.* A fundamental aspect of the interactionalist perspective is the belief that interactions with others influence the educational attainment process (Tinto, 1975, 2000). For example, previous research indicates that certain college experiences, such as peer relationships, extracurricular involvement, and interactions with faculty, enhance educational attainment (Pascarella & Terenzini, 1991). Tinto (1986) described a dynamic and interactive view of student experiences represented by interactional theory. He explained that interactional theories examine both individuals’ experience in an institutional culture and the interpretation and meaning that students attribute to their institutional experiences.

Interactional theory suggests that students’ “interactions across the academic and social geography of a campus shape the educational opportunity structure…” (Tinto, 2000, p. 94). Little is known, however, about how student experiences and interactions might vary by SES (Terenzini et al., 2001). This is a result of the use of socioeconomic status as a control variable rather than an independent variable of intrinsic interest. Recent studies, however, suggest that SES influences student interactions within institutional environments and shapes the educational opportunity structure (e.g., Terenzini et al.; Walpole, 2003). This finding supports Tinto’s (1975) postulate that, among other background characteristics, socioeconomic status directly influences students’ initial commitment to an institution and the goal of graduation. Students’ commitment to the institution and the goal of graduation in
turn affects the level of student integration into the academic and social system of the institution.

**Integrating perspectives.** While these multiple theoretical perspectives (i.e., sociological, economic, and interactional) have been advanced to enhance understanding of educational attainment, new theoretical perspectives on degree attainment can adopt an integrated approach that considers the combined influences of these multiple factors. Socialization perspectives emphasize the role of sociodemographic variables in the process of degree attainment, without consideration of institutional forces. Consequently, this framework ignores the environmental influence of institutions. Economic perspectives predominantly consider economic factors and therefore may mute the social forces (demographic and institutional) that contribute to earning a baccalaureate degree. Finally, traditional interactionalist perspectives fail to give adequate weight to how both economic factors and social class influence educational outcomes.

This research is a theory-based study that seeks to connect multiple theoretical models into an elaborated explanation of educational attainment for low-SES students. Theory can be defined as logically interrelated constructs that "present a systematic view of phenomena by specifying relationships among variables, with the purpose of explaining and predicting phenomena" (Kerlinger, 1973, p. 9). This definition allows for theory development by building upon interrelated constructs in an effort to gain a better understanding of complex phenomena. Thornberry (1989) defined integration as "the act of combining two or more sets of logically interrelated propositions into one larger set of interrelated propositions, in order to provide a more comprehensive explanation of a particular phenomenon" (p. 52). Braxton, Johnson, and Sullivan (1997) described the
difference between theory integration and theory elaboration. Theory integration needs to preserve the beginning causal arguments of each theory and reconcile differences in perspective. In theory elaboration, researchers look to build a more comprehensive model through the extension of basic propositions of a single model, without the need to reconcile or integrate differences in perspectives. Through the theory elaboration process, clarity and strength are maintained, while the inclusion of additional perspectives from other disciplines enhances the explanatory power of the original model. According to criteria established by Braxton et al., theory elaboration must begin with a single model and extend the model based on inclusion of perspectives taken from other disciplines. Therefore, this study seeks to elaborate on the socialization model of status attainment and to contribute to the understanding of baccalaureate degree attainment for low-SES students by adding additional perspectives from economic and interactional models.

Methodology

This study relies on a quantitative approach to elaborate on the socialization model of status attainment. To elaborate on the socialization model, I propose a model of degree attainment that incorporates additional factors from both the economic and interactional perspectives. This study hypothesizes how multiple variables work together to influence baccalaureate degree attainment for low-SES students and then examines data using structural equation modeling to produce results that either support or challenge the proposed model. A structural equation modeling procedure allows a representation of the hypothesized causal processes under study through a series of structural relations that are modeled pictorially to offer a clearer conception of a theory under study (Byrne, 2001).
Variables

The proposed causal model outlined in Chapter Three contains the following variables, which I hypothesize work together to influence degree attainment for low-SES students. While the specific definitions of the variables in the model are outlined in Chapter Three and Appendix A, this section provides a general overview of the variables considered in this study.

Control variables. To control for the influence of ethnicity and gender, these variables are included in the proposed causal model.

Socioeconomic status. Compared to income measures, SES combines multiple measures to create an index of wealth. The benefits of using SES instead of income include: a more refined measure of families’ access to social, economic, and educational opportunities; the inclusion of measures of social and cultural capital; and greater reliability and validity (Terenzini et al., 2001). Accordingly, this study includes measures of family income and parental education level.

Test scores and academic achievement. Research indicates that students’ previous academic performance is an important predictor of baccalaureate degree aspirations (Hossler et al., 1999; Pascarella, 1984) and degree attainment (Anderson, 1988; Milem & Berger, 1997; Sewell, Haller, & Ohlendorf, 1970). Therefore, this study includes measures of students’ high school grade point average and standardized test scores.

Aspirations. A central factor in the socialization model of status attainment is students’ degree aspirations. The development of educational aspirations is an important area of interest because this study hypothesizes that aspirations may function as intervening variables that mediate the influence of background characteristics and experiences on
educational attainment. Therefore, this study includes measures of students' degree aspirations at two distinct times: at the beginning of their college enrollment, and two years later.

**Finances.** Economic theories of educational attainment stipulate that degree attainment decisions mirror the perceived economic benefits and availability of financial resources necessary to invest in college attendance (Voorhees, 1985). This study considers it necessary to examine explicitly two variables, the effects of financial aid and the ability to pay, on degree attainment.

**Academic integration.** This study concentrates on the normative dimension of academic integration, which is an individual's identification with the normative structure of the academic system (Tinto, 1975). This variable represents a measure of an individual student's involvement with the academic environment of an institution.

**Social integration.** This variable represents a measure of an individual student's interaction with various social systems within a college. The concept includes involvement with informal peer groups and extracurricular activities (Tinto, 1975).

**Significance of the Study**

**Contributions to Knowledge**

This research is designed to contribute to the literature on degree attainment of undergraduate students. Scholars of higher education use several models and theories to explain educational attainment. The benefit of multiple theoretical models is the ability to advance understanding by providing new ways of thinking about and explaining the degree attainment process. However, the limitation of using several theoretical models to study degree attainment is the array of conceptual models that warrant the need to develop a more
synthetic view of educational attainment that integrates findings of the past and points out new questions for future inquiry (Tinto, 1986). For example, Braxton (2000) proposed revising Tinto’s interactionalist theory to build on economic, organizational, psychological, and sociological theoretical perspectives, and this study is one response to that proposal.

**Contributions to Practice**

Previous research indicates that students from lower socioeconomic backgrounds have lower educational expectations (Cabrera & La Nasa, 2000; Trusty, 2000). A longitudinal study of the educational process may offer insights into how SES and aspirations interact to impact students’ ability to earn degrees.

The status attainment model not only emphasizes how family background influences students’ degree aspirations, but also examines how both social class and family support shape the degree attainment process once students enter institutions of higher education. By conceptualizing the degree attainment process longitudinally, the current study explores the continual influence of family background on students’ educational experiences. A longitudinal approach offers potential insights into the interaction of family background, financial aid efforts, and students’ experiences within institutions, which may offer policy makers and institutional leaders information about ways to reconceptualize support programs or available policy levers for low-SES students.

It is important to investigate the indirect and direct effects of financial aid measures on students’ degree aspirations and educational outcomes because different types of financial aid awards may result in differences in college completion for low-SES students.

Understanding how institutional characteristics and institutional experiences influence educational outcomes of low-SES students may offer additional strategies to
enhance their educational attainment. As Carter (1999) suggested, "the role of institutional characteristics in the development of students' degree goals needs to be theoretically linked with the theoretical perspectives of status attainment" (p. 38). Institutions provide important academic and social support networks that enhance student integration, which in turn enhances educational achievement (Astin, 1984). These support networks provide important resources that assist low-SES students. Research that further examines how institutional support networks enhance the educational achievement of low-SES students will provide a better understanding of ways to improve institutional efforts by addressing specific barriers in a targeted manner.

Assumptions

Several assumptions guide this study. First, this study relies on several theoretical perspectives (i.e., socialization, economic, and interactionist) in an effort to examine baccalaureate degree attainment for low-SES students. This study assumes that it is possible to elaborate upon the socialization model through the inclusion of principles from the economic and interactionalist theoretical perspectives. While these three perspectives share several underlying principles, it is not the goal of this study to integrate the perspectives by reconciling differences among them. Instead, this study accepts the basic propositions of the socialization perspective and looks to extend those propositions.

Second, this study assumes that socialization, economic, and interactionalist perspectives can be considered collectively through status attainment theory. While each perspective offers important insights into distinct stages of the degree attainment process, together these perspectives portray educational attainment as a dynamic and continual process.
A third assumption flows from this ongoing nature of status attainment. Following Bourdieu's (1977) theory of social reproduction, the degree attainment process is largely shaped by students' previous accumulations of social, economic, and cultural capital resources. Bourdieu emphasized that the accumulation of capital resources is cumulative in nature (Berger, 2000; Horvat, 2001). Therefore, in the context of this study, SES is presumed to have a continual effect on the degree attainment process for low-SES students.

Fourth, this study examines students who have enrolled in institutions of higher education. In a national study, Cabrera and La Nasa (2000) found that students in the lowest-SES quartile faced additional challenges in completing three critical tasks necessary for enrolling in college: meeting minimal college qualifications, graduating from high school, and applying to an institution. The students in this study completed these critical tasks, and therefore represent a distinct category of low-SES students who successfully gained access to institutions of higher education. This study presumes, however, that enrollment in a college or university does not represent an endpoint in the educational attainment process and, as stated previously, that SES has a continued influence on degree attainment.

Finally, most of the higher education research that incorporates status attainment concepts focuses on successful achievement of degree attainment measured through degree completion. However, a vast amount of evidence explores the specific process of student persistence, which as an important precursor to earning a degree (Kocher & Pascarella, 1988; Tinto, 1987), and offers important theoretical and empirical foundations for understanding the factors that influence students' degree attainment. Therefore, this study references research that investigates both degree attainment and student persistence as important educational outcomes that are relevant to status attainment. For the purposes of this study, the
terms "educational attainment" and "degree attainment" both refer to attainment of a baccalaureate degree. This educational outcome is of primary interest to college administrators, policy makers, parents, and students, and this outcome supercedes year-to-year retention or persistence (Adelman, 1999).

**General Limitations**

This study focuses exclusively on traditional-age, dependent, undergraduate students attending four-year not-for-profit colleges and universities. Although a majority of students in the Beginning Postsecondary Student Survey (BPS: 96) series fall within this category, this study does not consider the experiences of low-SES students who do not meet these criteria.

The primary interest of this study is to examine factors that influence degree attainment of low-SES students. Therefore, gender and ethnicity differences within socioeconomic classes are not considered. Although such analysis is worthwhile, it is beyond the purpose and scope of this study.

Other research on the effects of SES presents contrasts between the top and bottom SES quartiles. This study represents an effort to test an elaborated theory of degree attainment for low-SES students. Future research may seek to compare degree attainment for various SES groups using a similar approach, but this research intentionally concentrates on low-SES students.

Previous research has considered between-college effects on educational attainment including institutional characteristics such as institutional quality, institutional control, and institutional size. Although these structural characteristics have statistically significant effects on educational attainment by shaping students’ social and academic experiences (Pascarella
& Terenzini, 1991), this study focuses on specific variables that influence educational attainment independent of where an individual attends college.

Previous research has demonstrated the importance of significant others’ influence in explaining the relationship between socioeconomic status and degree attainment (Hossler & Stage, 1992; Sewell et al., 1969; Stage & Hossler, 1989). However, the database used for this study does not include any measure of the influence of parents, family members, or peers on the educational attainment process. Therefore, this study does not address the important socialization influence of significant others.

Definitions

Capital - a form of power, access to resources.

Cultural capital - the attitudes, beliefs, resources, and values that families transmit to their children as a means of enhancing class status and privilege.

Degree attainment - earning a baccalaureate degree.

Economic capital - money or other resources with economic value.

Economic model - a model of educational attainment that examines the influence of economic factors on social mobility.

Habitus - “a deeply internalized, permanent system of outlooks, experiences, and beliefs about the social world that an individual gets from his or her immediate environment” (McDonough, 1997, p. 9).

Interactionalist model - a model of student departure that views student leaving as an outcome of how the individual interacts with other persons and with the institutional environment.

Social capital - a set of valuable connections or networks possessed by an individual.
Socialization model - a model of status attainment that assumes social interaction is structured by SES groups and explores how socioeconomic background, educational experience, and social support influence social mobility.

Social reproduction - a concept that SES is determined by parents’ status and is perpetuated through social systems, resulting in little social mobility.

Socioeconomic status - an index of wealth that includes social and economic measures.

Status attainment - social mobility through changes in occupational or educational status and income.

Summary

This study proposes to inform the scholarship of higher education by extending what is already known about how socialization, economic, and interactionist factors individually and collectively influence baccalaureate degree attainment for low-SES students. Specifically, the study seeks to elaborate on the socialization model of degree attainment by incorporating additional perspectives from both the economic and interactional theoretical perspectives. While several studies have considered each theoretical perspective in isolation, few studies integrate these perspectives to explain educational attainment as an ongoing, dynamic, and continual process. This approach seems particularly appropriate for low-SES students, who face multiple barriers in the baccalaureate degree attainment process.

Chapter Two provides a review of previous conceptual and empirical research to provide a context for a causal model that is proposed and tested in this study. The chapter begins with an overview of the status attainment model and social reproduction theory, to provide a context for understanding social class and educational attainment. Then, socialization, economic, and interactionist perspectives are described and related to status
attainment and social reproduction to describe how these perspectives offer important insights into baccalaureate educational attainment for low-SES students. The review of these individual perspectives includes examples of each and a clear rationale for incorporating factors from other perspectives in the proposed causal model.

Chapter Three outlines the general methodological approach, philosophical assumptions, methodology, data, sample, and variables for this study. The chapter details the proposed causal model for this study and the methodology for testing the model in efforts to answer the proposed research questions.

Chapter Four describes the results of the data analyses used to test the causal model and investigate the research questions.

Chapter Five discusses the results of the data analyses by considering the individual and collective influence of social, economic, and interactional factors on degree attainment of low-SES students. The chapter offers implications for education theory and practice.
CHAPTER 2

LITERATURE REVIEW

To outline the framework for this study and to provide support for the proposed causal model of baccalaureate degree attainment for low-SES students, it is necessary to review previous conceptual and empirical research. Two primary areas of literature—status attainment and social reproduction—inform this study. First, the status attainment literature provides a context that enhances understanding of how SES affects the degree attainment process. More specifically, the status attainment literature offers a lens to examine social mobility as a function of family social status (education, income of parents), individual academic achievement, and critical intervening experiences (e.g., influence of significant others) (Pascarella & Terenzini, 1991). Second, the theoretical perspectives and empirical studies regarding social reproduction inform this study. Bourdieu (1977) argued that educational systems reward individuals from advantaged status cultures, resulting in a reproduction of social class positions. When applied to higher education, the theoretical perspective of social reproduction seeks to analyze class inequality in higher education by focusing on institutional, societal, and cultural forces that shape the nature of student access to and experiences in higher education (Horvat, 2001).

Both the status attainment and the social reproduction theoretical concepts offer important insights regarding the connection between social class and educational inequities. The purpose of this chapter is to develop a conceptual framework for viewing educational attainment by building on these theoretical concepts. More specifically, this chapter uses the status attainment focus on social structures and Bourdieu’s (1977) social reproduction
concepts regarding optimization of capital resources to understand both barriers and optimizing strategies that influence educational attainment for low-SES students.

As noted in the first chapter, Terenzini et al. (2001) explained that much of the available research on how students from lower-SES backgrounds develop aspirations to attend college, prepare for college attendance, choose an institution, enroll, and persist to graduation is "largely atomistic" (p. 1). In response, this study is an effort to connect multiple theoretical models to provide an elaborated explanation of educational attainment for low-SES students. This chapter contextualizes the socialization, economic, and interactionalist perspectives within the theoretical concepts of status attainment and social reproduction to identify relevant factors in low-SES students' baccalaureate degree attainment. The common context provided by the status attainment and social reproduction theories explains the potential benefits of elaborating the socialization model to include important measures of capital suggested in the economic and interactionalist models.

Status Attainment Model Overview

The status attainment model has been the dominant paradigm in the study of educational and occupational attainment (Blau & Duncan, 1967; Jencks, Couse, & Mueser, 1983; Kao & Tienda, 1998; Pascarella & Terenzini, 1991; Sewell et al., 1969, 1970). The primary concern of the status attainment model is understanding the barriers that inhibit social mobility of individuals from lower-status groups. A common assumption of status attainment models is that social origins influence predetermined social structures and psychological traits (i.e., SES or academic achievement) are influenced by social origins which, in turn, affect individuals' educational and occupational status attainments (Sewell et al., 1970).
The status attainment model initially explored how class stratification and social structures shape differences in occupational attainment. In an expansion of the occupational attainment process, Blau and Duncan (1967) presented a model that retained the traditional independent variable of class stratification and the dependent variable of occupational prestige position, but added the level of educational attainment as an important mediating behavior variable. While the model provided new insights regarding the process of educational attainment and the relationship of educational attainment to future occupational attainment, it is important to highlight a significant limitation of the model. The Blau-Duncan model did not include psychosocial inputs such as peer groups, significant others, educational aspirations, or previous academic achievement, despite their acknowledgment that these variables are influential in the status attainment process (Sewell et al., 1969). Therefore, the model ignored potential factors that mediate the influence of input variables on attainment. While the model identified a clear connection between social stratification input variables (i.e., father's education and occupation) and individuals' subsequent education level and occupation, the Blau-Duncan model did not explain why this connection exists (Carter, 1999).

Subsequent researchers looked to improve upon the Blau-Duncan model through efforts to explicate how additional intervening variables could help explain variations in the educational attainment process and offer possibilities for manipulating the outcomes. These intervening variables include, among others, significant others' influence (Israel, Beaulieu, & Hartless, 2001; Sewell et al., 1969, 1970), cultural participation (Aschaffenburg & Maas, 1997; DiMaggio & Mohr, 1985), educational aspirations (Carter, 1999; Kao & Tienda, 1998; Sewell et al., 1969), and academic performance (Anderson, 1988; Sewell et al., 1969). The
inclusion of these variables forms a socialization (or social psychological) model of the status attainment process. The socialization model of status attainment assumes that SES and academic achievement of students affect the encouragement and support from significant others, which in turn affect students' goals and aspirations, ultimately shaping students' educational and occupational attainment (Kerckhoff, 1976; Sewell et al., 1969).

Pascarella and Terenzini (1991) explained that status attainment models are "theoretically important because they suggest a new approach to the understanding of social mobility; they view social mobility as a process of status attainment that develops over the life cycle" (p. 369). Following the perspective that status attainment is a life cycle process, completion of a baccalaureate degree plays an important role in the status attainment process. Degree attainment indirectly mitigates the influence of an individual’s background resources on subsequent occupational status and income (Jencks et al., 1983; Sewell et al., 1969, 1970). In addition, degree attainment has a direct effect on status attainment, even when SES is controlled (Pascarella & Terenzini).

The proposed causal model of degree attainment for low-SES students in this study is based on the socialization model of status attainment described above. In addition to the status attainment perspective, this study relies on the theoretical concept of social reproduction to elucidate the influence of SES on the status attainment process throughout the life cycle.

Social Reproduction

The higher education literature offers multiple insights into the effects of social class on students' experiences in college. Horvat (2001) identifies three separate strands of research on social class and higher education, including the influence of social class on
college choice (Hearn, 1984; Hossler et al., 1998), college experiences (Hurtado & Carter, 1997; Terenzini & Pascarella, 1991) and college completion (Cabrera, Nora, & Castañeda, 1993; Pascarella & Terenzini, 1980; Tinto, 1987). While these studies highlight differences based on class backgrounds, several scholars have noted that past research has not fully addressed the question of why these inequalities persist and how they are perpetuated (Horvat, 2001; Pascarella & Terenzini; Tierney, 1991). These scholars suggested the importance of asking critical questions and developing theories regarding the systemic and structural roots of inequality based on social class background.

Implicit in the beliefs that SES influences access to educational opportunities and shapes how individuals experience educational environments is the concept that social inequalities are perpetuated through a process of social reproduction. The concept of social reproduction stipulates that SES is determined by parents’ status, resulting in little mobility between generations (Bourdieu, 1977). Bourdieu suggested that individuals enter the educational system with different levels of cultural capital based upon their social background. Cultural capital can be defined as “proficiency in and familiarity with dominant cultural codes and practices” (Aschaffenburg & Maas, 1997, p. 573). According to Bourdieu, differences in cultural capital are not equalized throughout a student’s educational career, but are exacerbated over time. This concept is consistent with the status attainment perspective because both emphasize the enduring impact of social background. To summarize, students from lower-SES groups have less cultural capital, which influences students’ access to educational opportunities and shapes students’ educational experiences. Through this process of social reproduction, parents’ social class and cultural capital are reproduced and reflected in their children.
According to Horvat (2001), a new genre of higher education research places the roots of oppression in institutional, societal, and cultural forces that shape the nature of access to and experiences in higher education. Bourdieu’s framework for examining status groups offers a valuable conception of social reproduction in the context of higher education (DiMaggio & Mohr, 1985; Lareau & Horvat, 1999; McDonough, 1997). Bourdieu’s framework “shifts our focus away from looking exclusively at how individuals navigate the system of higher education, and directs our attention to exploring how the system reflexively structures individuals’ pathways” (Horvat, p. 201).

Relevant concepts within Bourdieu’s work include capital and habitus. The following is a brief discussion of these concepts for the purpose of examining SES and educational attainment.

Bourdieu (1987) discussed several forms of capital (i.e., economic, social, and cultural), but explained that all capital is essentially a form of power. Globally conceptualized, capital is a product of social class and offers access to resources, which can then be marshaled to produce advantages in social institutions (Lareau, 1989). Economic capital usually refers to money or other resources with economic value. Social capital can be understood as a set of valuable connections or networks an individual possesses (Horvat, 2001). Cultural capital encompasses the attitudes, beliefs, resources, and values that families transmit to their children as a means of enhancing class status and privilege (Bourdieu, 1977).

The concept of capital is valuable in understanding how social class shapes the social, cultural, and organizational experiences of students before they enter institutions of higher education and throughout their college experience. Individuals from higher-SES groups have
access to more capital resources and, according to Bourdieu, they use these resources to
maintain their position in society (Berger, 2000). Capital is “anchored in a stable set of
dispositions that emerge before adulthood,” resulting in a cumulative effect; individuals who
have greater access to capital early in life can more easily expand their holdings (DiMaggio
& Mohr, 1985, p. 1254). Because capital is a product of social class and has cumulative
effects on individuals’ ability to increase their position or status in society, this study
explores various forms of capital that may contribute to or inhibit the ability for low-SES
students to attain a baccalaureate degree.

In addition to capital, the concept of habitus is helpful in understanding the different
socializing influences based upon social class. McDonough (1997) defined Bourdieu’s
concept of habitus as “a deeply internalized, permanent system of outlooks, experiences, and
beliefs about the social world that an individual gets from his or her immediate environment”
(p. 9). Habitus offers an important understanding of how class status and family history can
place boundaries on the opportunities students feel are available to them, because it
represents a sense of place in the world and the internalization of various social possibilities
(Horvat, 2001). McDonough used the concept of habitus in a study of high school students
involved in the process of exploring higher education possibilities, searching for institutions
to attend, and choosing where to enroll. McDonough explained that students form a sense of
entitlement to a particular type of college education based on their social class. For example,
she explains that many high schools assume that students can rely on parents for some degree
of information in the college selection process. This practice ignores the different
experiences of lower-SES or first-generation college-bound students who face a great degree
of uncertainty.
In the wake of this uncertainty, the students' habitus may lead them to the belief that a college degree is unattainable since they lack "college-choice cultural capital" (McDonough, 1997, p. 100). When considering postsecondary plans among a sample of low-income high school students, King (1996b) found that parental encouragement was a decisive factor. As noted in the first chapter, SES influences the likelihood that parents talk to their children about college (Stage & Hossler, 1989) and the level of parental encouragement (Cabrera & La Nasa, 2000; McDonough, 1997). Research also demonstrates a relationship between socioeconomic status and the formation of postsecondary plans (Cabrera & La Nasa; King; Trusty, 2000). Taken together, the findings summarized above indicate that class status can place boundaries on the opportunities low-SES students feel are available to them.

The combination of capital and habitus in a model of social interaction provides a theoretical framework for examining the influence of SES on educational attainment. In Distinction, Bourdieu (1984) explained these concepts in relation to one another through the following formula: \[(\text{habitus}) \times (\text{capital}) + \text{field} = \text{practice}\]. Here, field is the set of rules and the place of struggle to control or exercise power over the rules. Practice represents the actions taken by individuals in social interaction (Horvat, 2001). Following Bourdieu's formula, actions are shaped by one's sense of place in the world (habitus), access to resources (capital), and the forces and rules that govern interaction (field). This formula offers important insights into the status attainment efforts of low-SES students. Horvat explained, "Family background and the cultural capital held by the family, as well as the habitus more generally, influence how a student will receive educational instruction, whether or not a student will become involved in the life of a college or how much education he or
she seeks...” (p. 211). Drawing from Bourdieu’s formula, this study examines how capital resources and habitus shape students’ ability to earn a baccalaureate degree.

Bourdieu’s formula combines the concepts of habitus and capital to promote a contextual understanding of social class. An example of how Bourdieu’s formula contributes to the understanding of lower-SES students’ experiences when searching for colleges is found in research by McDonough (1997), which explored the ways that high school students from different social classes conducted themselves during college visits. In the study, high-SES students behaved differently because they had previous socializing experiences that gave them a context for meeting new people, questioning campus authorities, and envisioning themselves in the college environment. These students benefited from past socializing experiences that form a context, or a habitus, which follows the social expectation of eventual college attendance. Low-SES students, however, were less likely to engage in the same types of interactive behaviors during college visits. Following Bourdieu’s (1984) formula, low-SES students’ access to resources (capital) and internalized beliefs about the social world (habitus) interacted to influence their actions. McDonough explained that “the issue least well-understood about students’ college destinations is the causal process — the web of opportunities, structural arrangements, contingencies, and timing — through which school context, SES, and family together shape the process of college planning and choices” (p. 6). While McDonough’s research supports the assertion that social class shapes the college planning and attendance process, the status attainment framework offers insights into the ways that individuals’ background characteristics and previous experiences influence the baccalaureate degree process both before students plan to attend college and after they enroll at an institution of higher education.
The previous sections that discussed the status attainment and social reproduction theories help to frame degree attainment as a process that develops throughout an individual's life. The following sections provide an overview of educational attainment research and models that rely on various theories to understand the "web of opportunities, structural arrangements, and contingencies" that shape the degree attainment process for low-SES students before and after they enter institutions of higher education. Three specific theories are addressed: socialization models, economic models, and integration models. These distinct models capture various segments of the degree attainment process including students' experiences before planning for college (socialization), students' available financial resources both before and upon entry to college (economic), and students' experiences within institutions (interactionalist). Similar to Terenzini et al. (2001), these various segments are conceptualized as distinct stages in a longitudinal degree attainment process. The purpose of the following sections is to demonstrate how socialization, economic, and interactionalist factors interact to influence degree attainment.

Socialization Perspective

The previous discussion of status attainment theory explained that the socialization perspective of status attainment assumes that SES affects the encouragement and support students receive from significant others, students' goals and aspirations, and individuals' eventual educational and occupational attainment (Kerckhoff, 1976; Sewell et al., 1969). The perspective discussed here is the socialization model of status attainment, which assumes that social interaction is structured by socioeconomic status groups. Recall that the purpose of this study is to elaborate on the socialization model of status attainment by adding additional perspectives from both the economic and interactionalist models. This section provides an
overview of the socialization model, which serves as the basis for the proposed causal model for this study.

Status attainment literature from the field of sociology provides the foundation for the study of educational aspirations (Carter, 2002). The socialization model of status attainment views aspirations as the central element in status attainment and explores how these aspirations are shaped by socioeconomic background, educational experience, and social support from others (Blau & Duncan, 1967; Jencks et al., 1983; Kerckhoff, 1976; Sewell & Hauser, 1980; Sewell et al., 1969). Pascarella and Terenzini (1991) provided a general socialization model of status attainment that integrates parental characteristics, high school achievement, standardized test scores, encouragement from others, and aspirations to explain educational attainment. The following discussion of the socialization model of degree attainment follows their general model, which is adapted from Blau and Duncan (1967) and Sewell and Hauser (1975), and is presented in Figure 2.1.

The proposed model in this study offered in Chapter Three elaborates upon the socialization model of status attainment to examine the individual and structural factors that influence degree attainment. Another model of status attainment, called the social allocation model, was developed in response to perceived theoretical shortcomings of the socialization model. The social allocation model was advanced first by Kerckhoff (1976), who criticized the socialization model because the model envisions the individual as relatively free to move throughout society; that attainment "is determined by what the individual chooses to do and how well the individual does it" (Carter, 2002, p. 133). In contrast, the social allocation perspective views the individual as constrained by social structure, and holds that status attainment is a function of what the individual is allowed to do. Horvat (2001) explained that
Bourdieu's social reproduction theory offers a bridge between individual action and social structure through "a dialectical blending of individual and structural forces [that] brings to the forefront of our analyses an attention to the macro and micro level of analyses. We [then] no longer view individuals independent of their structural context..." (p. 201). In a similar manner, this study seeks to position low-SES students' individual baccalaureate degree attainment within a context that considers how both individual factors and social structures shape the process.

![Diagram of Socialization Model of Educational Attainment](Image)

*Figure 2.1: A Socialization Model of Educational Attainment (Pascarella & Terenzini, 1991)*
The following paragraphs address the individual factors identified in the socialization model illustrated by Figure 2.1. The sections address how parental characteristics (SES), encouragement from others, academic achievement, and educational aspirations individually and collectively influence educational attainment.

**SES**

Research substantiates the important influence of family socioeconomic factors (i.e., parental income and education) on subsequent status attainment outcomes (Smart, 1986; Smart & Pascarella, 1986). One specific family factor, parental income, has a demonstrated impact on educational attainment. For example, previous research stipulates that parental income is positively related to support for students to attend college (Elkins, Braxton, & James, 1998), strongly predicts of college attendance (Ver Ploeg, 2000), positively relates to persistence (Hull-Toye, 1995), and significantly predicts of college completion (Frehill, 2000). While these studies support the important influence of parental income on educational attainment, it is important to understand the nature of the relationship. The socialization model of status attainment suggests that parents’ economic conditions, or economic capital, provide them with silent resources that can either enhance or inhibit their ability to assist their children in efforts to attain different status levels (Lareau & Shumar, 1996). In an example of the pervasive effect of economic conditions on efforts to attain a different status level, King (1996b) concluded the percentage of low-income senior students planning to attend a four-year institution lagged behind seniors of other SES groups (66, versus 80 to 85, percent).

Parental education level is another important variable to consider. Using data from the National Educational Longitudinal Study in 1988, Cabrera and La Nasa (2000) explored
barriers to college entrance for students from low-SES families. When dividing students’ SES level into quartiles, they reported that fewer than one-quarter of the lowest-SES parents can provide their children with assistance based on firsthand collegiate experiences, while nearly all of the highest-SES students (over 99%) grew up in families that were familiar with postsecondary education. Parents interact with their children and educational institutions with different levels of knowledge, strategies, and practices that are shaped through their educational experiences. As parents’ educational level increases, their children are more likely to develop postsecondary educational plans (Hossler & Stage, 1992) and to earn a college degree (Frehill, 2000). Hossler et al. (1999) concluded that, compared to parents who have not attended college, parents who attended are more familiar with the experience and are better equipped to explain the intricacies of the college system and how to prepare.

Using a Bourdieuan framework, students’ educational credentials result from an accumulation of cultural capital brought by the student into the educational institution (Horvat, 2001). Students from low-SES families have limited access to social networks and information agents that promote their ability to consider educational opportunities as a way to enhance social status (Lareau & Shumar, 1996; Smith-Maddox, 2000). The research summarized above indicates that low-SES students are less likely to have an accumulation of cultural capital or educational credentials, which in turn influences degree aspirations, support networks, and degree completion.

Encouragement from Others

Sewell et al. (1969) hypothesized that significant others’ influence was of central importance in explaining the connection between social stratification background variables and educational attainment. They offered strong support for a social psychological
explanation of educational attainment, finding that SES directly affected the influence of significant others, measured by parents’ encouragement for college, teachers’ encouragement for college, and friends’ college plans. In turn, the influence of significant others had direct effects on individuals’ levels of educational aspiration and subsequent college attainment.

The role of parents is particularly influential on students’ educational aspirations (Hossler & Stage, 1992; Hossler et al., 1999). In a longitudinal study of high school students in the state of Indiana, Hossler et al. found that parents and other family members had the largest effect on students’ college aspirations. This supports previous research that suggests parental support and encouragement offers one of the best predictors of educational aspirations (Hossler & Stage; Stage & Hossler, 1989).

*Academic Achievement*

Socialization models posit that in addition to parental characteristics, students’ academic achievement influences their educational aspirations (e.g., Pascarella, 1984; Sewell et al., 1969, 1970). According to previous research, students’ intellectual self-esteem is related to educational aspirations (Astin, 1993). There is some evidence that suggests high school achievement is the second-best predictor of postsecondary aspirations, following parental encouragement and support (Hossler et al., 1999). Sewell et al. (1970) suggested that increases in academic performance have direct effects on significant others’ expectations, students’ educational aspirations, and students’ educational attainment. Other studies support this contention, finding that increases in high school academic achievement are associated with greater support to attend college (Cabrera & La Nasa, 2000; Elkins et al., 1998; Hossler, Braxton, & Coopersmith, 1989; McDonough 1997), increased likelihood of attending
selective institutions (Anderson, 1988), greater academic integration (Milem & Berger, 1997), and higher college grades (Anderson).

Socioeconomic status has a clear impact on academic achievement. Terenzini et al. (2001) reported a difference between lowest-SES-quartile students and their more affluent peers in students' preparedness for college study. They noted that lowest-SES-quartile students are more likely to be in the lowest achievement quartiles in reading, math, and science. Terenzini et al. also noted a positive and linear relationship between SES quartile and both ACT and SAT composite scores, with highest-SES-quartile students having significantly higher composite scores compared to students in the lowest two SES quartiles.

Considering the relationship between socioeconomic status and academic achievement, several studies control for the influence of educationally relevant variables, such as college entrance test scores or high school achievement to elucidate the unique influence of ascribed or socioeconomic characteristics on educational attainment (e.g., Hearn, 1984).

Aspirations

The formation of educational aspirations and the ability of students to achieve their educational goals are of primary interest to researchers using a status attainment perspective. Previous research examined how educational aspirations are shaped by socioeconomic background, educational experience, and social support from others (e.g., Hossler et al., 1999; Sewell et al., 1969). The development of educational aspirations represents an important area of interest because these aspirations can function as an intervening variable that mediates the influence of previous background characteristics and experiences on educational attainment (Sewell et al.). Several studies in higher education look beyond the development of educational aspirations to explore how degree aspirations influence college
choice (Hossler & Gallagher, 1987; Hossler et al., 1999), and educational attainment (Ethington, 1990; Gruca, Pascarella, & Walberg, 1989; Jencks et al., 1983; Sewell et al., 1970).

The literature offers contradictory findings regarding the relationship between SES and students' educational aspirations. For example, one study indicates that in comparison to students from higher-SES groups, students from lower-SES groups may be more likely to have higher degree aspirations and to place a greater value on college attendance (Ethington, 1990). Ethington found that although students from lower-SES levels had higher expectations for success and placed a higher value on education than did higher-SES students, these did not translate into significant indirect influences on persistence. The finding that low-SES students' high educational aspirations did not influence persistence suggests that other variables mediate the effect of degree aspirations on degree completion for students from low-income families. In direct contradiction to Ethington's findings, other research suggests that income has a pervasive effect on postsecondary plans, with low-SES students being less likely to develop postsecondary plans (i.e., aspirations) than higher-SES counterparts (Cabrera & La Nasa, 2000; King, 1996b; Terenzini et al., 2001). Despite the contradiction in the research findings summarized above, each of the studies suggests that SES has an important influence either on the formation of educational aspirations or the ability of low-SES students to realize their educational aspirations.

Bourdieu's social reproduction theory provides a framework to examine the enduring effects of social class. While the formation of aspirations is central to the understanding of status attainment from the socialization model, aspirations also represent an important function in social reproduction. Recall the formula proposed by Bourdieu (1984) and
discussed near the beginning of this chapter: \((\text{habitus} \ (\text{capital})\ ) + \text{field} = \text{practice}\). By defining habitus as an individual’s sense of place in the world and internalization of social possibilities, it is possible to equate students’ habitus with their educational aspirations when exploring the practice or individual action of baccalaureate degree attainment. Aspirations clearly are rooted in family context based upon family income (Cabrera & La Nasa, 2000), parental education level (Hossler & Stage, 1992; McDonough, 1997), and encouragement from parents (Hossler et al., 1999). These aspirations serve to generate and limit the range of possible actions (or practice) available to low-SES students in efforts to attain a baccalaureate degree. In the context of this study, factors such as parental income and education level are important because they are hypothesized as forms of capital resources (economic and cultural) that shape low-SES students’ aspirations and interact with these aspirations to influence degree attainment.

Students’ aspirations and access to capital are not static. Therefore, it is important to measure capital and aspirations at multiple times to differentiate between the effects of early socialization and later socialization (Aschaffenburg & Maas, 1997). This study relies on two measures of low-SES students’ aspirations, one at the beginning of their college enrollment and the other two years later.

To summarize, the socialization model of status attainment seeks to understand the barriers that inhibit the social mobility of individuals from lower-status groups. The socialization model holds that “a student’s socioeconomic status affects the way he or she interacts with others (and in turn how others interact with the student), which affect aspirations and ultimately attainment” (Carter, 2002, p. 133). The socialization model of status attainment focuses on students’ educational aspirations, but does not consider
explicitly the potential within-college effects of students' experiences on these aspirations. The following section, therefore, identifies areas of the socialization model that warrant elaboration to adequately describe the degree attainment process for low-SES students.

Call for Elaboration

While several studies use status attainment models to study educational aspirations, few examine how sociodemographic variables and experiences connect with achieving students' educational goals (Stage & Hossler, 2000). Stage and Hossler suggested a comprehensive student-centered theory of persistence that combines the elements of student background, school experiences, intentions and preparations, and college entry to examine students' decisions to stay or leave an institution. While their model explicitly addressed college persistence, it moves beyond the examination of college predisposition and educational attainment as separate and distinct processes, but rather links them conceptually. Both status attainment and social reproduction theory support this integration of various parts of the educational attainment process. However, one limitation of the comprehensive student-centered theory of persistence suggested by Stage and Hossler is that it views background characteristics (e.g., SES) as external factors and examines how the factors of background, school experiences, intentions and preparations, college entry, and persistence interact in a linear fashion. Their model, therefore, does not account for the interaction between the factors, nor does it examine multiple direct effects, such as the effect of background on persistence.

Similar to the research of Stage and Hossler (2000), this study systematically examines the variables and experiences associated with educational attainment. By elaborating the socialization model of status attainment, the causal model proposed in this
study moves beyond simply exploring the role of students' socialization experiences and aspirations on educational attainment. Stage and Hossler explained that a sample for degree attainment that includes all students would serve only to reinforce existing research described throughout this chapter. To identify factors that may help low-SES students attain a baccalaureate degree, it is important to focus on the population of interest and to examine multiple factors beyond the early socialization experiences of low-SES students. The next sections present two additional models that expand upon the socialization model to offer additional insights into the degree attainment process. The sections describe the economic and interactionalist models, to identify additional factors and capital resources that interact with low-SES students’ socialization experiences to influence the degree attainment process.

Economic Perspective

Financial aid has been shown to have a positive effect on both college attendance (St. John, 1990) and on baccalaureate degree attainment (Cabrera et al., 1992). However, several studies suggest that the shift in federal financial aid policies from gift aid to self-help aid, regardless of need, threatens equal access to educational opportunity (Fenske, Porter, & DuBrock, 2000; King, 1996a). For example, the 1992 reauthorization of the Higher Education Act allowed for greater borrowing limits and established a loan program that is open to all students regardless of need. King explained that federal student loan programs are shifting from creating access for disadvantaged students to broadening choice and enhancing convenience for middle-class students. At a time when students are more concerned about affordability, the shift in financial aid from grants to loans has important policy implications for low-SES students. Therefore, it is important to investigate the indirect and direct effects of financial aid measures on students’ degree aspirations and educational outcomes. This
becomes especially important when examining low-SES students because, following Bourdieu’s theory, financial aid resources are economic capital that may enhance low-SES students’ educational attainment.

Tinto (1986) explained that economic theories of educational attainment (e.g., Manski & Wise, 1984; Voorhees, 1985) stipulate that retention and departure decisions mirror the economic benefits of degree attainment and the financial resources necessary to invest in continued college attendance. Tinto argued, however, that these theories emphasize the importance of individual finances and financial aid in students’ educational attainment decisions, without consideration of the “social or nonpecuniary forces inside and outside institutions that color individual decisions regarding persistence” (p. 363). Additionally, he stated that although it is clear that financial considerations are important for degree attainment of students from disadvantaged backgrounds, there is little evidence to support the contention that economic forces are paramount in degree attainment.

Status Attainment and Economic Factors

As noted previously, the status attainment model examines the impact of sociodemographic variables on students’ degree aspirations and educational attainment. In a slightly different view compared to other status-attainment research, Jencks et al. (1983) conceptualized educational aspirations as rational assessments of the costs and benefits of possible actions. Jencks et al. envisioned aspirations as an economic evaluation of an individual’s current financial circumstances. Following this proposition, aspirations may not indicate an intrinsic motivation, as suggested in other status-attainment models, but rather the material feasibility of continuing in school. This conception of aspirations as an economic evaluation of resources places the availability of financial resources, rather than socialization,
as the primary influential factor on students' educational aspirations. The logic emphasizes the importance of economic resources on students' aspirations and educational attainment, suggesting that low-SES students are particularly vulnerable to declining educational aspirations and attainment because of a lack of economic resources. Thus, students' degree attainment decisions mirror economic forces such as the potential income benefit of a bachelor's degree and the financial resources required to attain a degree.

Several studies demonstrate that family economic resources are an important factor in the development of educational aspirations (Cabrera & La Nasa, 2000; Kao & Tienda, 1998; Trusty, 2000). For example, Cabrera, Stampen, and Hansen (1990) found that students' ability to pay, measured by satisfaction with cost of attendance and SES, moderated the effect of students' educational aspirations on persistence. This finding suggests that finances may influence degree attainment indirectly through aspirations. Few studies, however, provide a similar examination of the impact of financial aid on students' educational aspirations (Cabrera et al.; Carter, 1999).

Previous studies on financial aid and educational attainment primarily have focused on the ability of financial aid to equalize educational opportunities by eliminating income differences (e.g., Hossler et al., 1989; St. John & Noell, 1989; Stampen & Cabrera, 1988) or the effectiveness of aid packages in promoting persistence (e.g., Bean, 1985; St. John, 1990; St. John, Kirshstein, & Noell, 1991; Stampen & Cabrera, 1988). Although these two lines of inquiry have offered important insights regarding the role of financial aid in equalizing educational opportunity or promoting persistence, they do not promote an understanding of how financial aid interacts with students' motivational and ability factors or institutional experiences (Cabrera et al., 1990).
In an example of research that integrates financial aid with other factors that influence degree attainment, St. John et al. (1991) used educational attainment models as a foundation for a conceptual model of the effects of student financial aid on persistence to degree completion. St. John et al. concluded that educational attainment models provided a basis for a logical extension of financial aid research to include the interaction of financial aid with other factors that influence degree attainment. For example, in addition to measures of financial aid, their model explicitly incorporates measures of academic integration (e.g., grades) as part of a student’s educational experience and a measure of educational aspirations as an indicator of goal commitment. The model used by St. John et al. incorporates features from several areas of research to view degree attainment as a function of “social background, academic ability/achievement, high school experience, postsecondary aspirations, college experiences, and student financial aid” (St. John et al., p. 386).

Similar to the model proposed by St. John et al. (1991), this research considers it necessary to explicitly examine the effects of financial aid variables on degree attainment. Economic factors have a clear influence on low-SES students’ ability to complete a baccalaureate degree. Berger (2000) used Bourdieu’s concepts to frame the importance of financial aid on persistence and degree attainment. He explained that it is important to understand, “how well the financial aid package (including considerations of tuition and financial aid) meets student expectations regarding the amount of material resources they are willing to invest for a degree…” (p. 112). Recall that low-SES students, as a result of their background (cultural, social, and economic capital) and habitus, are less likely to feel that they are entitled to a baccalaureate degree and may believe that attainment of a baccalaureate degree is beyond their resources. Following Bourdieu’s framework and Jencks’ et al. (1983)
concept of low-SES students' rational assessments of the costs and benefits of investing in an education, financial aid becomes a critical influence on degree attainment. Financial aid represents an important economic capital resource that influences the ability of low-SES students to earn a baccalaureate degree. While research supports the notion that financial aid does make a difference in persistence (Leslie & Brinkman, 1988) and degree attainment (St. John et al.), the availability of financial aid does not entirely mitigate the negative effects of poverty (St. John et al.).

Even though financial aid does not entirely mitigate the effects of low socioeconomic status, it is clear that financial aid is an important resource. Several measures of economic resources are especially relevant when exploring degree attainment for low-SES students. St. John (1990) suggested that need-based grant aid is especially important for low-SES students, and recommended policies that increase grants for low-SES students to promote student access. St. John et al. (1991) concluded that research should include both loans and grants when examining the effects of student aid. Additionally, low-SES students are more likely to be price-responsive to tuition than are students from families with greater incomes (St. John & Starkey, 1995), suggesting that, in addition to grants and loans, researchers need to consider price and tuition. St. John, Cabrera, Nora, and Asker (2000) concluded that comprehensive models of student persistence need to include variables relating to family resources, educational costs, and student aid awards. The next section posits that these economic variables are important sources of economic capital that interact with background characteristics and aspirations to influence degree attainment.
Expanding the General Socialization Model

Horvat (2001) used Bourdieu’s theoretical framework to examine issues of equity and access in higher education. She explained, “Bourdieu’s framework shifts our focus away from looking exclusively at how individuals navigate the system of higher education, and directs our attention to exploring how the system itself reflexively structures individuals’ pathways” (p. 201). Instead of viewing student aspirations and degree attainment as individual behaviors, this framework draws attention to the ways that economic capital such as financial aid can structure the pathway for low-SES students. Horvat also noted that capital is converted in accordance with an individual’s habitus, which is consistent with Bourdieu’s formula regarding the interaction of capital and habitus on individual’s behavior. This framework offers an understanding of the theoretical interaction between financial aid (economic capital) and aspirations (habitus). Low-SES students who bring high aspirations may not have adequate economic resources to realize those goals. Conversely, low-SES students with low aspirations may not be able to convert economic resources into a baccalaureate degree if their aspirations or habitus limit the perceived value of a baccalaureate degree or reduce students’ confidence in their ability to earn a degree.

Initial approaches that studied college student persistence used organizational and sociological theories to understand the interaction of student-related factors with institutional experiences (e.g., Bean, 1982; Tinto, 1975). Cabrera et al. (1992) pointed out, however, that these early theoretical perspectives typically have failed to consider the integrated role of financial factors in the persistence process. While several early studies promoted structural models to determine the impact of precollege variables and institutional factors on retention rates (e.g., Nora, 1987), few studies incorporated measures of student finances and financial
aid with precollege variables and institutional factors (Nora, 1990; Voorhees, 1985). While persistence is not the outcome variable of interest in this study, it is also clear that studies using the socialization model of status attainment similarly often fail to incorporate measures of student finances and financial aid in relation to degree attainment.

As noted by Cabrera et al. (1992), most finance studies typically include measures of other variables, such as precollege motivational factors, academic ability, demographic factors, socioeconomic status, and college performance, to “control for background or precollege sources of variance when assessing whether financial aid or combinations of student aid packages increase persistence” (p. 572). Voorhees (1985) also highlighted the research designs that do not explain the relationships among variables selected for research: “The result has been a profusion of ‘stepwise’ multiple regression analyses and multidiscriminant analyses that dissect, or pull apart, variables without regard to how they might work together to impact persistence rates” (p. 22). Studies that control for background characteristics or independently examine variables have not theoretically examined or tested empirically the causal relationships between finance variables and other factors known to influence educational outcomes. This lack of integration of financial factors into the research is critical given public investment in financial aid programs and the efforts of policymakers and practitioners to understand how financial aid influences the entire persistence and degree attainment process (Cabrera et al.).

In response to this call for integration, several studies explored the effects of finances on persistence, while incorporating economic factors in the context of noneconomic variables such as academic skills, academic integration, social integration, and goal commitment (Cabrera et al., 1990, 1992; Nora, 1990; St. John et al., 1991). In one example, Cabrera et al. 
(1990) provide a model that is drawn from Tinto’s (1975) student integration model, Bean’s (1982) and Nora’s (1987) findings regarding the influence of support from others on persistence, and Vorhees’ (1985) research indicating that economic need negatively affects college academic performance. While their model included the variables in the integration model, it added the novel element of ability to pay as a variable that directly affects students’ decisions to persist in college. In addition, they hypothesized that financial variables also would have an indirect influence on persistence by moderating the effects of commitments, academic performance, and institutional variables on decisions to remain at an institution.

The results from the study did not indicate that ability to pay (SES) moderated the effect of either academic performance or social interaction on a student’s decision to persist. They did, however, report an interaction between students’ ability to pay and goal commitment, providing support for Tinto’s (1975) claim that external factors are likely to moderate the effect of goal and institutional commitments. In other words, Cabrera et al. (1990) supported the hypothesis that financial variables moderate the effect of educational aspirations, which contradicts a common assumption that an individual’s commitment to complete college can overcome lack of financial resources.

In another example of integrating financial variables with other factors that influence degree attainment, Cabrera et al. (1992) explored the indirect and direct effects of finances on persistence in the context of variables such as significant others’ influence, precollege academic achievement, academic and social integration, goal and institutional commitments, and intent to persist. Their model of student persistence posited that finances have a direct effect on persistence decisions while affecting students’ social and academic experiences. The model also assumed that finances have a direct effect on academic integration, social
integration, and institutional and goal commitments. The model posed by Cabrera et al. is theoretically important because it considered, “What are the effects of student finances on college persistence when academic ability, motivational, and integration and commitment variables (as well as their underlying structural patterns) are simultaneously taken into account” (p. 588)? Their research effectively converged two separate lines of research that previously considered the role of financial and organizational/sociological factors in isolation. Cabrera et al. found support for the indirect influence of finances on the persistence process, demonstrating that finances affect students' academic integration, socialization, and resolve to persist in college.

Figure 2.2 presents the causal model developed by Cabrera et al. (1992). Their model suggests the holistic nature of student finances in relation to students' degree attainment efforts. Cabrera et al. found a lack of direct effects of finances (measured by students' satisfaction with financial support and student financial aid received) on persistence decisions, indicating that financial variables alone are not enough to explain the degree attainment process. However, their findings indicated the indirect effect of finances on persistence and the academic and social facets of students' educational experiences. Their research suggests that future studies need to consider the effect of finances within the context of intellectual, academic, socialization, and motivational factors that also shape degree attainment. This model is particularly relevant to the integration of finance variables into the proposed causal model explored in this study and described in Chapter Three.
It is important to consider the ways that economic factors interact with other predictors of degree attainment. This study explores the theoretical interaction between financial aid (economic capital) and aspirations (habitus) on low-SES students’ degree attainment behavior. The model for this study places economic factors (financial aid) directly following the early socialization experiences of low-SES students. The next section provides a final perspective that offers important variables that can elaborate on the socialization
model of degree attainment. More specifically, the interactionalist perspective adds an additional dimension by considering the influence of students’ experiences within institutional academic and social environments.

**Interactionalist Perspective**

Interactionalist theories view student departure as a function of both individual and organizational factors by focusing on individuals’ experiences in the total culture or environment of an institution. These theories explore the role of informal social interactions and subcultures on students’ persistence decisions and investigate how individuals attach meaning to their experiences within institutions (Tinto, 1986). One of the most widely cited interactionalist theories is Tinto’s (1975) integration theory of student departure. Tinto explained that when considering individual characteristics, prior experiences, and commitments, integration into the academic and social systems of an institution shape commitment to the goal of college graduation and commitment to the institution. These commitments to graduation and the institution influence the likelihood an individual will remain at an institution (Tinto, 1975). In the context of this study, interactionalist perspectives address a third stage of degree attainment that encompasses students’ experiences throughout their enrollment at an institution. While the previous section examined the importance of economic variables in the degree attainment process, several studies indicate that students’ experiences after they enroll in college play an even more vital role in degree completion (e.g., Cabrera et al., 1992; Pascarella & Terenzini, 1991).

A rich body of literature explains the influence of college experiences on students’ development, demonstrating that educational outcomes are shaped through students’ interaction with the college environment (Pascarella & Terenzini, 1991). For example, in a
review of the literature that addresses students' learning and cognitive development, Terenzini, Pascarella, and Blimling (1996) examined how students' out-of-class experiences influenced academic, intellectual, and cognitive learning outcomes. They summarized several studies that report positive associations between students' out-of-classroom contacts with faculty members and academic or cognitive development. They also provided ample evidence that peer interactions including educational or intellectual activities are beneficial to students. One of the conclusions offered in their review highlighted the need to analyze students' interpersonal interactions with peers and faculty in an effort to improve understanding of how these interactions help shape students' experiences and development.

Despite the strong support for the influence of college experiences on students' development, Terenzini et al. (2001) noted "the research literature is virtually silent about how the experiences of college students might vary by socioeconomic status" (p. 24). They explained that the reason for this is not the omission of social class background, but rather its use as a control variable rather than as a variable of intrinsic interest.

*Interactionalist Perspective and Status Attainment*

While the integration theory explicitly addresses student departure, it offers an important contribution to the socialization model of status attainment. Tinto's model envisions colleges as similar to other communities, placing the process of persistence within the context of community membership. Student decisions to remain at an institution are influenced directly and indirectly through an individual's social and intellectual experiences in the multiple communities or social spheres within the institution (Tinto, 1986).

While status-attainment research in higher education has included institutional characteristics such as selectivity (Anderson, 1988; Thomas, 1981), institutional type
(Anderson, 1988), and institutional quality (Griffin & Alexander, 1978), few studies examine students' individual experiences of the social and academic environments using a status-attainment perspective (Grosset, 1997). Anderson (1988), however, synthesized the basic ideas from both the status attainment (socialization) model and Tinto's (1975) interactionalist model to create a causal model that focuses on the structural and organizational determinants of educational attainment. Anderson explained that status attainment models focus more on the direct and indirect effects of precollege variables such as ascribed status, prior achievement, and individual aspirations. In contrast to the status attainment models, she indicated that persistence models (e.g., Tinto's interactionalist model) are more concerned with social-psychological processes. For example, she noted that the Tinto model describes how social and academic integration, instead of sociodemographic variables, mediate the effects of previous goal commitments.

Anderson's (1988) research indicated that background characteristics, including SES, have a direct and continuous effect on students' college choice, extent of involvement, and achievement. Braxton et al. (1997) explained the significance of Anderson's research, indicating that her efforts to link college persistence to issues of social reproduction and social attainment "provides perspectives on the role that educational opportunities play in students' ability to attain higher social status or achievement" (p. 141). In short, Anderson's combination of the status attainment model and the interactionalist model supports the use of the status attainment lens to examine how the interaction of students' background characteristics with the structural features of the college environment influences degree attainment.
A limitation of studies using the interactionalist perspective has been a lack of attention to the role of external factors in shaping students' perceptions, commitments, and preferences (Bean, 1985; Cabrera et al., 1993). A substantial body of research that explores the influence of college on students indicates that students' interactions with the college environment are not independent of the background characteristics they bring to college (Anderson, 1988; Nora & Rendon, 1990). Even though researchers recognize the need to account for the influence of students' background characteristics on students' social and academic integration and subsequent educational attainment, most studies control for pre-college characteristics that correlate with persistence/dropout behavior (Pascarella & Terenzini, 1980). In efforts to explain the complexities of degree attainment, it is important to focus on interactions between student characteristics and institutional experiences. By applying the concept of habitus to students' integration into the academic and social institutional environments, student background characteristics play a prominent role in how students experience the institutional environments. Rather than concentrating on the behaviors that help students become successfully involved with the institution, this focus examines how individual outlooks influence interaction with the college environment and how "access and equity are shaped in our institutions" (Horvat, 2001, p. 196).

Academic and Social Integration

Tinto's (1975) theoretical model views students' persistence decisions as a function of their integration into the social and academic systems of the college. This integration in turn influences students' subsequent commitment to the institution and the goal of graduation. Research using Tinto's model typically measures academic integration by academic performance, involvement with intellectual groups, and academic interaction with
faculty. Social integration measures include participation in social activities and nonacademic interaction with faculty and peers. The next sections discuss academic integration and social integration as well as the relationship between the two constructs. A general interactionalist model is presented in Figure 2.3 to provide a visual representation of how the interactionalist model portrays the influence of student background characteristics on academic integration and social integration.

![Figure 2.3: General Interactionalist Model (Nora & Rendon, 1990)](image)

*Academic integration.* Academic integration is characterized by individuals' identification with the normative structure of the educational system (Tinto, 1975). Academic integration typically is measured by students' academic performance and level of intellectual
development. Tinto hypothesized that the greater the level of academic integration, the greater the subsequent commitment to the goal of college graduation.

Research offers mixed conclusions regarding the influence of academic integration on educational attainment. Pascarella and Terenzini (1991) indicated that grades are the best predictor of students' likelihood of obtaining a baccalaureate degree. Several other studies suggest that academic integration has relatively meaningful direct and indirect effects on persistence (Cabrera et al., 1993; Donovan, 1984; Pascarella & Terenzini, 1980). Other research, however, indicates that academic integration does not have strong empirical relationships to institutional commitment or intent to re-enroll (Bean, 1985; Braxton et al., 1997; Milem & Berger, 1997). Berger (2000) offered one potential explanation for this difference by positing that academic integration is not important for all students, implying that for students from various backgrounds who bring different levels of capital and habitus, academic integration may be a more important precursor to degree attainment. Through specific exploration of low-SES students' academic integration experiences, this study examines the influence of academic integration on degree attainment for low-SES students and can test Berger's hypothesis.

Social integration. There is substantial evidence that supports the role of socialization, or the social interaction with students, faculty, and staff, in the educational attainment process. The status attainment model (Sewell & Hauser, 1975) stipulates the importance of interaction with significant others to the attainment process. Integration models also highlight the importance of social participation in the connection with an institution (e.g., Tinto, 1975). From these perspectives, interaction with peers serves important functions suggested by Lin (1999) and McDonough (1997). Peer and faculty
interaction may expose students to a social network that facilitates the flow of information, exerts influence, enhances social credentials, and reinforces identity. These benefits may serve to support the formation and realization of higher aspirations and goals (habitus). Through social interactions with achievement-oriented peers, students may have greater access to information about educational possibilities and develop greater degree aspirations. As students become integrated within this community of peers, they may develop greater personal resources, such as self-confidence and specialized knowledge, that support these aspirations.

Several studies indicate that social involvement has a positive effect on bachelor's degree attainment, even when controlling for such factors as family socioeconomic status and academic aptitude (Pascarella, Ethington, & Smart, 1988; Stoecker, Pascarella, & Wolfe, 1988). Multiple studies using national samples suggest that the level of student-faculty social interaction is positively related to bachelor's degree attainment (Kocher & Pascarella, 1988; Pascarella et al., 1986). These findings are consistent with the status attainment model, which emphasizes the relationship between interaction with significant others and the attainment process.

This interaction is likely to enhance existing educational aspirations, rather than fundamentally change attitudes regarding education (Pascarella & Terenzini, 1991). In a study that included 74 four-year institutions, Pascarella (1985) found that when controlling for precollege characteristics and institutional characteristics, students with close personal relationships with faculty had significantly higher precollege educational aspirations compared to students who did not have close connections with faculty. In turn, social interaction with faculty was positively related to subsequent educational aspirations.
Combined, these findings indicate that students with greater aspirations are more likely to interact with faculty members and that these social interactions bolster these existing aspirations.

Terenzini et al. (2001) found that students' involvement in out-of-class experiences differed significantly across SES groups. Using data from the National Study of Student Learning (NSSL), they found that, compared to the highest-SES-quartile students, lowest-SES-quartile students reported lower levels of involvement with other students, clubs, and organizations, participation in student union programs, and use of recreational facilities. Terenzini et al. found similar results regarding a national sample from the 1990 Beginning Postsecondary Studies Survey. Using an index of social integration, they found a significant difference in the social integration of lowest-SES-quartile students compared to highest-SES-quartile students.

Recursive nature of integration. Social integration and academic integration tend to interact in a reciprocal manner (Pascarella & Terenzini, 1991). As student academic integration (measured by variables such as grades and contact with faculty) decreases, students' social integration (measured by variables such as extracurricular involvement and peer interactions) has a greater influence on persistence or degree attainment. Conversely, as academic integration increases, the role of social integration in persistence or degree attainment decreases. There is a need to understand how academic and social life are connected, rather than conceptualizing these aspects as distinct activities (Braxton, Bray, & Berger, 2000; Tinto, 2000). Therefore, this study explores the interaction between these variables for low-SES students.
Expanding the Socialization Model

Research that only explores the direct effects of input and environmental variables provides no information regarding the process by which student input characteristics or environmental factors indirectly influence aspirations and educational attainment (Pascarella, 1984). Tinto (2000) called for analysis that explores the complexity of student involvement in efforts to “shed important light on how interactions across the academic and social geography of a campus shape the educational opportunity structure of campus life and, in turn, shape both student learning and persistence” (p. 94). When conceptualizing status attainment as a life-long process, then, in addition to the exploration of how academic and social interaction interact to influence educational attainment, it is important to recognize that students’ background characteristics and experiences prior to college enrollment may influence students’ integration into the social and academic spheres of campus life. Tinto described the educational opportunity structure as the “interconnected chains of relationships and interactions out of which personal affiliations are wrought and contextual learning arises” (p. 92). The educational opportunity structure of campus life in this sense has clear connections with students’ experiences and background.

Several studies support the validity of the interaction between financial and non-economic variables in influencing students’ socialization experiences once they enter institutions. Previous research has demonstrated that financial aid has an impact on students’ socialization process (Cabrera et al., 1992), academic and social integration (Cabrera et al., 1990; Stampen & Cabrera, 1988; Vorhees, 1985), and subsequent departure decisions (St. John et al., 1996). These studies suggest that financial aid is important not only because it promotes expanded access to higher education institutions, but also because it indirectly
facilitates student integration into the academic and social aspects of the institution and influences student commitment to remain in college. In this sense, economic capital can serve to remove or reduce students' barriers to participation in various academic and social components of the institution. As Berger (2000) noted, individuals from different classes may experience organizational environments in different ways because of their habitus and previous experiences. In this sense low-SES students may have distinct experiences in the academic and social spheres within institutions.

Students' experiences outside of the classroom not only influence student learning and development, but also contribute to other valued educational outcomes. This study examines how the perceived and experienced institutional environments produced through contacts with peers, faculty, and others influence educational outcomes such as degree attainment (Kuh, 1995). While research supports the benefits of out-of-class experiences, Kuh recommended that additional research take into account the extent to which students from various groups participate in and benefit from these activities. In response to this recommendation, this study specifically examines how low-SES students experience the academic and social environments of institutions and how these experiences relate to other factors to influence degree attainment.

Summary

This chapter used the theoretical concepts of status attainment and social reproduction to form a general overview of the educational attainment process, with specific emphasis on the socialization, economic, and interactionalist factors that influence low-SES students. This common context explains the potential benefits of elaborating the socialization model to include important measures of capital suggested in the economic and interactionalist models.
More specifically, this study explores the interaction of factors from the socialization model, including SES, academic achievement (i.e., high school academic performance and college entrance test scores), and aspirations, with factors from economic models (i.e., student financial aid), and with factors from interactionalist models (i.e., academic and social integration), to examine low-SES students' baccalaureate degree attainment. Chapter Three provides additional details regarding the methodology of this study and a proposed causal model of degree attainment based upon the literature review, and outlines the research design that will test the theoretical model empirically and address the proposed research questions for the study.
CHAPTER 3
METHODOLOGY

Chapter Three provides an overview of the methodology that guides this study. The first part of the chapter provides a rationale for the quantitative approach and the associated epistemological assumptions. Next, the research approach is explained, including an overview of the proposed causal model and how the model relates to the research questions of this study. Then, the data source, participants, variables, and data analysis procedures are presented. The chapter concludes with information regarding design issues and limitations of the study.

Methodological Approach

This study seeks to elaborate upon existing theory regarding students’ educational attainment by formulating a model and then testing it through empirical data. Using a deductive approach, this study hypothesizes themes or patterns before data collection and then searches the data to support or challenge the proposed model. More specifically, this study relies on a quantitative approach to elaborate on the socialization model of status attainment. Similar to other quantitative studies, the deductive design of the study uses data to test the hypothesized relationships among the variables of interest (Krathwohl, 1998).

While the deductive design of this study hypothesizes how multiple variables work together to influence baccalaureate degree attainment for low-SES students, it is difficult to describe social and behavioral phenomena because of the complex relationship among variables. The relationships among variables form a complex pattern in which any effect is likely also to be a cause of a future event. In addition, multiple variables often influence effects, both directly and indirectly (Krathwohl, 1998). The review of previous research in
Chapter Two helps to distinguish among the multiple possible variables that influence degree attainment and offers insights into factors that have a significant influence on degree attainment for low-SES students in particular.

In addition to elaborating the socialization model of status attainment, this study serves a replication function by testing aspects of various theoretical models that previously investigated the influence of students' pre-college socialization, economic resources, or interaction within institutions on degree attainment. The combination of additional variables from various theoretical models offers potential methodological benefits, which enhance the ability of this replication to validate previous research (Krathwohl, 1998). In other words, by grounding this research in various theoretical models, this study offers new ways to test hypothesized relationships among several variables that have been demonstrated to influence degree attainment.

**Philosophical Assumptions**

Several epistemological assumptions guide quantitative research. First, it is based upon a logical positivist philosophy that contends there is a single objective reality that is separate from the beliefs of individuals (McMillian & Schumacher, 1997). This assumption stipulates that features of the social environment exist independently of individuals who create them or observe them. According to this philosophy, abstract concepts such as involvement or SES can be observed and measured. Second, the purpose of quantitative research is to establish relationships or explain causes of changes in social reality. The positivist approach maintains a mechanical view of causation, stipulating that variables such as SES, income, or support of others can be viewed as real social objects that exert force on subsequent variables (Gall, Borg, & Gall, 1996). Stage (1990) explained that quantitative
researchers attempt to explain the world through the notion of causation and that quantitative research techniques provide, “an estimate of our attempts at such explanation” (p. 431). Following the notion that researchers can explain the world through causation, this study examines specific hypothesized relationships among variables that influence degree attainment by testing a proposed causal model. Third, quantitative research uses an established set of procedures and steps to guide the researcher and relies upon research design to reduce subjectivity. Fourth, quantitative research seeks to establish universal generalizations that are context-free (McMillian & Schumacher, 1997). The last two assumptions stipulate that appropriate research design and methods can be used to guide researchers in making decisions regarding studied hypotheses.

The literature reviewed in Chapter Two provided an overview of the socialization, economic, and interactional factors that influence baccalaureate degree attainment. The summary at the end of the chapter explains that previous research has not specifically identified the underlying structural patterns among variables selected for the study of degree attainment and persistence (Nora, 1990). Following the epistemological assumptions of this study and the contention that there is a need to develop a greater understanding of how socialization, economic, and interactional factors work together to influence degree attainment, this study tests a causal model of degree attainment.

Causal Model

Figure 3.1 provides a diagram depicting the conceptual framework that guides the analysis used for this study and displays the propositions under empirical examination. The model is longitudinal and posits that students’ SES and early socialization experiences shape their educational aspirations. In turn, it is expected that these precollege variables will
influence the nature of students’ interaction within the academic and social institutional environment. Additionally, students’ access to financial resources in the form of financial aid is thought to influence students’ educational aspirations and interaction with institutional environments. Finally, baccalaureate degree attainment is hypothesized as dependent upon the preceding variables in the model. The causal ordering of variables on degree attainment is as follows: SES, high school academic achievement and test scores, financial aid, initial aspirations (before attending a higher education institution), academic and social integration, and subsequent aspirations (after two years of attending a higher education institution). The operationalization of these variables is described later in the independent variables section.

*Figure 3.1: Proposed Causal Model of Degree Attainment*
Causal Model and Research Questions

At this point, it is helpful to consider how the proposed causal model relates to the research questions of this study. The purpose of this study is to develop an integrated understanding of how social, economic, and interactional factors affect degree attainment for low-SES students. Although this study focuses on degree attainment for low-SES students, two student background characteristics are included to control for the effect of individual differences on student outcomes (Astin, 1993; Pascarella & Terenzini, 1991). Specifically, the variables of ethnicity and gender are considered in the causal model to control for their subsequent effect on behaviors and outcomes.

The socialization model of status attainment reviewed in Chapter Two assumes that SES affects the support to attend college that individuals receive, the formation of educational aspirations, institutional experiences, and eventual degree attainment. The first research question for this study asks how SES influences low-SES students' baccalaureate degree attainment. As seen in the model, it is posited that SES has a direct effect on high school achievement, test scores, initial educational aspirations, and financial aid. Furthermore, the status attainment and social reproduction literature support the hypothesis that SES continues to have an indirect effect on degree attainment throughout students' educational experiences, including their experiences within institutions and the development of subsequent educational aspirations (second research question). The hypothesized long-term impact of SES can be seen through close examination of the direct and indirect effects suggested in the proposed causal model.

The third research question for this study considers how financial aid affects degree attainment of low-SES students. As seen in Figure 3.1, the causal model hypothesizes that
financial aid has a direct effect on both students' educational aspirations and their institutional experiences (academic and social integration). The model also hypothesizes that financial aid has a direct effect on low-SES students' degree attainment.

The fourth research question examines the effect of social and academic integration on low-SES students' degree attainment. In short, the proposed causal model hypothesizes that academic and social integration have a direct effect on the development of students' educational aspirations, which in turn affects their degree attainment.

The final research question asks how SES, financial resources, degree aspirations, academic integration, and social integration interact to influence degree attainment for low-SES students. The purpose of Chapter Two was to provide the reader with insights regarding the interaction among these important factors that influence degree attainment for low-SES students. Following Bourdieu's (1984) formula, [(habitus) (capital)] + field = practice, this study hypothesizes that family background and capital resources, as well as individuals' habitus, influence the entire degree attainment process.

The proposed causal model described above is used as a starting point for elaborating the socialization model of status attainment by describing how economic and interactionalist factors also contribute to understanding degree attainment. The next section describes the methods used to examine the proposed causal model and research questions for this study.

Methods

Data

The data used in this study are drawn from the 1996 Beginning Postsecondary Students (BPS) Longitudinal Study, which is one of several studies sponsored by the National Center for Education Statistics to respond to the need for a national, comprehensive
database on postsecondary education. The BPS series specifically addresses issues related to persistence, progress, attainment, and rates of return to society. The students were interviewed first during 1996 as part of the 1995-96 National Postsecondary Student Aid Study (NPSAS:96). Two academic years after the initial interview, the first follow-up interview (BPS: 1996/1998) was conducted. A second follow-up with the BPS: 1996 cohort occurred three academic years after the first follow-up interview in 2001 (BPS: 1996/2001). The BPS: 1996/2001 is useful in tracing the paths of students through the entire system of postsecondary education over six years, which allows for the collection of attainment information for students, especially those who complete four-year programs in five years. The BPS longitudinal study contains four sections of interview data regarding postsecondary enrollment and degree attainment, undergraduate education experiences, postbaccalaureate education experiences, and employment information. This study relies on data from the first two sections—postsecondary enrollment/degree attainment and undergraduate education experiences.

BPS is a useful data set to determine educational aspirations, progress, and attainment for various types of students. Unlike studies that explore educational outcomes at a single institution, BPS allows for the study of these outcomes anywhere since it monitors progress across postsecondary institutions. Another strength of the BPS is the amount of longitudinal information it provides on financial aid and unmet need, which may have differential effects on degree attainment for various income groups.
Sample

Detailed descriptions of the sampling frames and procedures used for the BPS: 1996/2001 are found in a methodology report by the National Center for Education Statistics (NCES, 2002). The base for the BPS: 96 is the National Postsecondary Student Aid Study (NPSAS), which is a recurring survey of national cross-sectional sample of postsecondary students. The NPSAS: 96 employed a two-stage sampling design that selected eligible higher education institutions at the first stage and selected eligible students from responding sample institutions at the second stage. A total of 8,934 eligible NPSAS: 96 individuals responded to all three rounds of the survey (BPS: 96, BPS: 96/98, and BPS: 1996/2001). The BPS: 1996/2001 sample is representative of students who first began postsecondary studies during the 1995-96 academic year at any postsecondary institution in the United States (NCES, 2002).

For this analysis, a subset of the BPS: 1996:2001 was selected. Specifically, low-SES students were selected from the total of 8,934 respondents to the three survey rounds. Consistent with other research, this study used several measures to achieve a composite SES variable that merges measures of family educational and occupational attainment (e.g., Terenzini et al., 2001). It is also useful to note that this measure is reflected in most of the data sets developed by the National Center for Education Statistics (NCES). Low-SES students are defined as individuals who are classified as moderately or highly disadvantaged on three indicators of socioeconomic diversity: total family income as a percentage of the 1994 federal poverty level, the highest educational level completed by either parent, and the proportion of the student body in the student's high school eligible for the free or reduced-price lunch program in 1994-95.
For this study, educational attainment is defined as the completion of a bachelor's degree by June, 2001. Students attending two-year institutions are not considered in the analysis. Previous research and theoretical models that form the basis for this research examined traditional college-aged students who are financially dependent upon their parents. Similarly, this research only considers traditional-aged students who are categorized as dependents.

Of the 8,934 respondents to the longitudinal study, 822 students attended four-year institutions and were categorized as moderately or highly disadvantaged on a SES diversity index and were dependent. Respondents with missing information for any of the variables of interest in this study were eliminated, resulting in a final sub-sample of 437 respondents. Table 3.1 summarizes demographic information of the sub-sample considered in this study. Chapter One described the limitation of not considering institutional characteristics such as size, control, and selectivity in this study. However, this demographic information is provided in Table 3.1 to provide a context for the types of institutions attended by the sub-sample of low-SES students.
Table 3.1
Sample Demographic Information (n = 437)

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>n</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>269</td>
<td>61.6</td>
</tr>
<tr>
<td>Male</td>
<td>168</td>
<td>38.4</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>183</td>
<td>41.9</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>94</td>
<td>21.5</td>
</tr>
<tr>
<td>Hispanic</td>
<td>97</td>
<td>22.2</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>60</td>
<td>13.7</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>Age (on 12/31/95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>4</td>
<td>0.9</td>
</tr>
<tr>
<td>18</td>
<td>269</td>
<td>61.6</td>
</tr>
<tr>
<td>19</td>
<td>139</td>
<td>31.8</td>
</tr>
<tr>
<td>20</td>
<td>23</td>
<td>5.3</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Institution size and control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td>6</td>
<td>1.4</td>
</tr>
<tr>
<td>Public (1,000 - 2,499 enrolled)</td>
<td>8</td>
<td>1.8</td>
</tr>
<tr>
<td>Public (2,500 - 4,999 enrolled)</td>
<td>17</td>
<td>3.9</td>
</tr>
<tr>
<td>Public (5,000 - 9,999 enrolled)</td>
<td>64</td>
<td>14.6</td>
</tr>
<tr>
<td>Public (10,000 - 19,999 enrolled)</td>
<td>110</td>
<td>25.2</td>
</tr>
<tr>
<td>Public (20,000 or more enrolled)</td>
<td>118</td>
<td>27.0</td>
</tr>
<tr>
<td>Private (under 1,000 enrolled)</td>
<td>7</td>
<td>1.6</td>
</tr>
<tr>
<td>Private (1,000 - 2,499 enrolled)</td>
<td>37</td>
<td>8.5</td>
</tr>
<tr>
<td>Private (2,500 - 4,999 enrolled)</td>
<td>18</td>
<td>4.1</td>
</tr>
<tr>
<td>Private (5,000 - 9,999 enrolled)</td>
<td>12</td>
<td>2.7</td>
</tr>
<tr>
<td>Private (10,000 or more enrolled)</td>
<td>38</td>
<td>8.7</td>
</tr>
<tr>
<td>Private for-profit</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Institution selectivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least selective</td>
<td>300</td>
<td>68.6</td>
</tr>
<tr>
<td>Selective</td>
<td>48</td>
<td>11.0</td>
</tr>
<tr>
<td>Very selective</td>
<td>89</td>
<td>20.4</td>
</tr>
</tbody>
</table>
Various statistical analysis weights for the BPS: 1996/2001 sample were computed by NCES to be used for analyzing data. A set of longitudinal weights were constructed by applying a series of adjustments for sub-sampling and nonresponse (e.g., unable to locate, refusal). Because the sub-sample for this study represents a specific category of respondents (i.e., low-SES, dependent, enrolled in a four-year institution) the longitudinal analysis weight was not used. The multivariate analyses of data in this study are not intended to represent the entire BPS: 1996/2001 sample; therefore, the use of the statistical analysis weights is not necessary. In addition to the longitudinal weights, NCES constructed variance estimation weights to be used with special software designed to analyze complex sample survey data. The sampling strategy for BPS: 1996/2001 represents a complex sample due to the two-stage sampling design. Again, due to the specific sub-sample selected for this study, it was determined that it would not be appropriate to use the calculated variance estimation weights, which were based upon the entire BPS: 1996/2001 sample.

Independent Variables

This research tests a structural equation model of educational outcomes for low-SES students. The proposed structural model contains four exogenous constructs and six endogenous constructs as independent variables. The four exogenous constructs include ethnicity, gender, SES, and financial aid. High school academic achievement, college entrance test scores, aspirations (two measures at different times), academic integration, and social integration are endogenous constructs. The measures used to define conceptual areas directly suggested by previous research are listed below. Additional information regarding the variables in this study can be found in Appendix A.
Background control variables. Extensive research has established the correlation between student achievement and various demographic variables such as race-ethnicity, income, parent education, gender, age, and family structure (Desimone, 1999; Hurtado, Inkelas, Briggs, & Rhee, 1997). To control for the influence of these important factors, ethnicity and gender are included in the model as control variables. The other variables listed above are incorporated into the model.

SES. A composite SES measure based on three indicators of socioeconomic disadvantage: family income as a percentage of the 1994 federal poverty level, the highest educational level of either parent, and the proportion of the student body in the student’s high school eligible for the free or reduced-price lunch program in 1994-95.

Test scores. Derived SAT combined score, calculated as either the sum of SAT verbal and math scores or the ACT composite score converted to an estimated SAT combined score using a concordance table.

Achievement. Academic achievement is measured through a single variable, student high school grade point average.

Aspirations. Two separate measures of student aspirations are part of the model for the study. The first aspiration is the highest degree ever expected in 1996 and the second is the highest degree ever expected in 1998.

Financial measures. Financial measures considered in this study include total grant amount 1995-96, total loan amount 1995-96, total work study received 1995-96, and total student budget (estimates cost based on tuition paid and number of months enrolled).

Academic integration. Derived variable based on average response indicating how often respondents have done the following: participated in study groups, had social contact
with faculty, met with an academic advisor, or talked with faculty about academic matters outside of class.

*Social integration.* Derived variable based on average response indicating how often respondents have done the following: attended fine arts activities, participated in intramural or non-varsity sports, participated in varsity or intercollegiate sports, participated in school clubs, or gone places with friends from school.

*Dependent Variable*

The dependent variable for the study is a dichotomous variable indicating if the respondent has earned a baccalaureate degree by June 2001, six years after the start of the study.

**Data Analysis Procedures**

This study uses structural equation modeling (SEM), which is a statistical methodology that follows a confirmatory or hypothesis testing approach regarding a proposed causal model generated from theory (Byrne, 2001). Byrne explained the two important aspects of the SEM procedure: “(a) that the causal processes under study are represented by a series of structural (i.e., regression) equations, and (b) that these structural relations can be modeled pictorially to enable a clearer conceptualization of the theory under study” (p. 3). Raykov and Marcoulides (2000) described SEM as a statistical method that provides researchers with a comprehensive method for the quantification and testing of theories. This form of multivariate correlational analysis offers a method for measuring latent or unobserved variables with maximal reliability and validity and a powerful test of causal relationships specified by a theory (Gall, Borg, & Gall, 1996).
Several aspects of SEM differentiate it from other multivariate procedures. First, SEM takes a confirmatory approach to data analysis by testing a specified pattern of relationships among variables, which facilitates inferential analysis of data. In contrast, other multivariate procedures are exploratory and descriptive in nature (Byrne, 2001). Second, Stage (1990) explained that SEM allows for the estimation of reciprocal causal flow between two variables that mutually affect one another (e.g., academic and social integration). Third, SEM analytic techniques are useful in the estimates of constructs based on both unobserved (latent) and observed variables (Byrne, 2001). SEM models usually contain theoretical or hypothetical constructs that are not directly measurable, and thus possibly are not well-defined. Researchers in the behavioral sciences are often interested in studying these theoretical constructs that cannot be observed directly, which are called latent constructs. SEM procedures use observed variables to serve as “indicators of the underlying construct that they are presumed to represent” (Byrne, 2001, p. 5). An example of this technique is the use of the observed variables of income and education level as indicators of the latent variable socioeconomic status. Fourth, while researchers using traditional multivariate procedures need to assume that variables are measured without error, one main reason for the use of structural equation modeling is that it explicitly takes into account measurement error in the model variables (Raykov & Marcoulides, 2000). Byrne explained that by ignoring error, other multivariate procedures may lead to inaccuracies in analysis, especially when errors are sizeable. When considering several of these benefits, Stage concluded that SEM affords a “more comprehensive test of a model’s empirical adequacy as an explanatory system...” (p. 429). Combining these characteristics offers a global overview of SEM as a
use of sample statistics to estimate unknown aspects of a studied phenomenon that are related to the distribution of variables considered in a model.

The structural equations within a model include specifications of paths from exogenous to endogenous variables and among endogenous variables (Stage, 1990). Byrne (2001) distinguished between exogenous and endogenous variables, stipulating that exogenous latent variables are independent variables that cause variation in other latent variables in the model. In contrast, endogenous latent variables are dependent variables influenced by the exogenous (or other endogenous) variables in the model.

When researchers hypothesize the impact of one latent construct on others through a causal model, the SEM model comprises both a measurement model and a structural model (Byrne, 2001). The measurement model is comprised of the measurement of latent constructs which is depicted in the model through links between observed measures and latent variables. Confirmatory factor analysis provides a statistical test of the proposed relations between observed measures and latent variables (i.e., measurement model). The factor-analytic model focuses on “how, and the extent to which, the observed variables are linked to their underlying latent factors” (Byrne, p. 6).

The structural model depicts links among latent variables in the model. This study relies on a specific SEM model called a structural regression model. Structural regression models have an additional characteristic compared to other SEM models, in that some of the latent variables are regressed on others. Once the constructs within a model have been assessed, researchers can test the plausibility of assertions about the explanatory relationship of multiple constructs (Raykov & Marcoulides, 2000).
In SEM, the researcher posits a causal statistical model that is based on theory, previous research, or a combination of both. Once a model is specified, the researcher tests the model using sample data. When conducting the analysis, SEM models are fit to covariance or correlational matrices between all pairs of observed variables, to see how well the observed data fit with the proposed model. To accomplish this task, a mathematical model is constructed to analyze covariance structures using regression coefficients and the variances and covariances of the independent variables (Byrne, 2001, p. 13). In short, the researcher determines the "goodness of fit between the hypothesized model and the sample data" (Byrne, p. 7).

In SEM, the researcher imposes the structure of the proposed causal model on the sample data and then tests the fit between the model and the data. The differential between the data and the model is called the residual. Byrne (2001) summarized the model-fitting process as follows: "Data = Model + Residual" (p. 7). In this formula, data are the measurements of the observed variables, model is the proposed causal model, and residual is the discrepancy between the model and the data. After testing a specified model, researchers may follow a model-generating approach (Joreskog, 1993), where the researcher rejects a proposed model because of poor fit and then proceeds to locate the source of the poor fit to develop a new model that better describes the sample data. The ultimate objective is to develop a model that has substantive meaning and a strong statistical goodness of fit (Joreskog).

Linear Structural Relationships (LISREL) 8.54 statistical analysis software (Joreskog & Sorbom, 2002) was used to conduct the data analysis. Previous research has used LISREL to test various causal models of college persistence (e.g., Anderson, 1988, Cabrera et al.,
1992, 1993; Grosset, 1997). The estimation of parameters using SEM follows the maximum likelihood (ML) method. Byrne (2001) explained that use of ML estimation assumes several conditions: (a) large sample size, (b) normal distribution of observed variables, (c) valid hypothesized model, and (d) the scale of observed variables is continuous. In particular, the fourth assumption concerning scaling has been the subject of debate, especially when ordinal variables are treated as continuous variables in analysis (Byrne). The dependent variable in this study is degree attainment, which represents a dichotomous categorical variable.

Due to the categorical nature of the dependent variable, a non-normal distribution may produce misleading results. It is possible to use software (e.g., PRELIS) to estimate the correct correlations among ordinal, categorical, and continuous variables to produce an estimate of the asymptotic covariance matrix under arbitrary non-normal distributions (Browne, 1984). Hayduk (1987) cautioned that this process assumes that the observed non-normal distribution occurs because poor cutpoints were used to specify various categories. The process, therefore, is designed to improve poor category specification rather than handle truly categorical variables. Given this precaution and the normal distribution of the dependent variable, this study did not estimate the asymptotic covariance matrix.

Design Issues

Internal validity. Krathwohl (1998) defined internal validity as "the power of a study to create a consensus that the appropriate interpretation of the evidence is that the variables are linked in a relationship—to support an inference linking cause to effect" (p. 138) and identified five judgments that constitute internal validity or linking power of a study. These judgments include explanation credibility, translation fidelity, demonstrated result, rival explanations eliminated, and credible result. The first two judgments, explanation credibility
(reasonableness of rationale for the relationship) and translation fidelity (faithfulness of concepts' operational definition), rely on theoretical conceptual evidence provided in Chapter Two to link the variables of the study. The next two judgments, demonstrated result (hypotheses supported) and rival explanations eliminated (rule out other explanations), rely on the empirical evidence from the study and the analysis of the data. The last judgment, credible results, considers the consistency of the findings with previous research and the strength of the empirical evidence.

Recall that the SEM has both a measurement model and a structural model. The measurement model addresses the concept of translation fidelity. Because the primary purpose of the structural model is to assess the extent to which relationships among latent variables in a hypothesized model are valid, it is especially critical that the measurements of latent variables in the model are psychometrically sound (Byrne, 2001). To ensure the validity of the measurement model, confirmatory factor analysis (CFA) procedures are conducted for hypothesized indicator variables for each latent construct. In addition, if two or more variables are highly correlated, resulting in multicollinearity, a second CFA model that includes only one of the correlated variables can be specified to reduce content overlap (Byrne).

The LISREL model solution provides estimates for identified parameters. Before considering the fit of the model, parameter estimates should have the correct sign and magnitude as predicted by theory. Also, the standard errors associated with each parameter should not be large, otherwise the model does not provide reliable information (Raykov & Marcoulides, 2000).
The hypothesized causal model can be tested statistically to determine the extent to which the model is consistent with the data. If a goodness of fit measure is adequate, then the model offers a plausible explanation of the relationships among variables (Byrne, 2001). Several fit indices were used to make generalizations about the validity of the model by measuring the extent to which the estimated model reproduces the sample covariance matrix (Raykov & Marcoulides, 2000; Stage, 1990). The overall measures of model fit provide a summary picture of how well the proposed model fits the whole analyzed covariance matrix, but no information is provided about how well the model reproduces individual elements of the matrix. Therefore, it is important to identify any areas of misfit in the model (Joreskog, 1993). Two types of information assist in determining model misspecification—standardized residuals and modification indices (Byrne, 2001). Examination of standardized residuals provides information about possible paths or covariances to add or remove to improve the fit of the model. Again, the purpose of SEM is to test the fit between the covariance matrix estimated by a hypothesized model and the sample covariance matrix; any discrepancy between the two matrices is contained in the residual covariance matrix. Examination of the standardized residual stem-and-leaf and Q plot demonstrates any serious model misspecifications or violations of the normality assumption (Raykov & Marcoulides, 2000). Additionally, standardized residual values greater than 2.58 are considered to be large (Byrne, 2001) and may represent model misspecification.

The second indication of model misspecification, modification indices, represents the extent to which the hypothesized model is accurately described. For each fixed parameter, the researcher can examine a modification index. If the specified model does not fit, it is possible to improve the initial model that does not fit the data satisfactorily. Modification
indices indicate potential parameters to change in order to improve the model (Stage, 1990). This method is helpful for “improving a model that is not fundamentally misspecified, but only incorrect to the extent that it has some missing paths or some of its parameters are involved in unnecessarily restrictive constraints” (Raykov & Marcoulides, 2000, p. 44). Any modifications, however, must be supported by previous theories or research results.

*External validity.* Krathwohl (1998) defined external validity as the evidence used to infer how widely a relationship applies or the generality of the findings. A frequent assumption when using SEM is that the observed variables have a linear relationship. Structural regression models test proposed theories about explanatory relationships among various latent variables (Raykov & Marcoulides, 2000). Because of this component, the consideration of relationships among variables is based upon the researcher’s knowledge of literature to specify a causal model (Stage, 1990).

In contrast with other modeling approaches, SEM looks to find a model that does not contradict the data. In an empirical test using SEM, the researcher is typically interested in retaining the proposed model and accepting the null hypothesis. Because SEM methodology seeks to retain a proposed model, not rejecting a fitted model does not support the claim that it is a true model. The process of using empirical data to test theory about a phenomena of interest through SEM is often called the confirmatory mode (Raykov & Marcoulides, 2000). The testing of theoretical models assists in the development of knowledge through uncertainty reduction (Krathwohl). If the uncertainty about the interpretation or applicability of a theoretical model is high, the research claim does not offer a strong contribution to understanding. When the evidence sufficiently reduces uncertainty below a certain threshold, it offers greater value as a contribution to knowledge.
Limitations

There are several limitations to this study. First, the data in the study are limited to measures available in the BPS (1996/2001) national database. For example, comprehensive measures of the construct “significant others’ influence,” an important factor in students’ degree aspirations, were not available. This limitation restricts the ability to examine the indirect influence of SES on students’ initial education aspirations.

The hypothesized model represents a general model of degree attainment limited to the available variables in the dataset and the specification of causal paths. Important variables may be left out of the analysis due to possible misspecification of the model, which may ignore factors that are important for the construct being analyzed or may overestimate the importance of other variables that have only a minor relationship to the constructs (Stage, 1990).

Another potential weakness of the study design is the potential for suppression and multicollinearity when using a large number of separate measures as controls and independent variables (Byrne, 2001). Additionally, the complexity of the proposed model presents multiple parameters for estimation, which may prevent a clear and parsimonious analysis of the data. For this reason, several variables, such as academic integration, social integration, and financial aid, are examined through constructed variables to reduce the complexity of the model. These strategies, however, limit the ability to dissect potential effects of multiple variables such as different sources of financial aid. Future research may expand upon the proposed model to include additional measures of latent variables.

As highlighted throughout Chapters One and Two, low-SES students are less likely to earn a baccalaureate degree. Nearly half of the BPS: 1996/2001 respondents who were
categorized as moderately to highly disadvantaged on a socioeconomic diversity scale were
not considered in this study because of missing data. NCES (2002) reports a 10% non-
response rate for personal and family finances and high school grade point average. These
variables are of particular interest for this study and represent variables that may be
especially sensitive for low-SES students. The analyses in Chapter Four, however, assume
that the remaining respondents in the sub-sample are representative of low-SES students who
CHAPTER 4
DATA ANALYSES AND RESULTS

This chapter describes the results of the data analyses used to investigate the research questions of this study. An overview of factors influencing the degree attainment process for low-SES students can be obtained by using a combination of descriptive and multivariate statistics. The purpose of this study is to develop an integrated understanding of how social, economic, and interactionalist factors affect degree attainment for low-SES students. In an effort to present a systematic view of degree attainment, the structure of the data is examined first through descriptive statistics of the variables, then by looking at relationships among variables through multivariate statistical techniques.

This chapter is divided into three main sections. The first section summarizes the descriptive statistics for the variables used in this study. The second section describes the initial analysis of the causal model and the modifications to the proposed model, to develop a final model used for multivariate analysis. The third section combines descriptive statistics and multivariate analyses to address each research question posed in Chapter One.

Descriptive Analysis

Before the discussion of multivariate analyses, it is helpful to examine the variables used in the SEM model by considering the variables' definitions and related descriptive statistics. Appendix A provides definitions for all of the variables used in the structural equation model. An examination of the means and standard deviations of the variables considered in this study provides a simple way of describing the low-SES students considered in this study.
As explained in Chapter Three, the sub-sample ($n = 437$) was drawn from the total sample of BPS 1996:2001 respondents who were classified as moderately to highly disadvantaged on a derived socioeconomic diversity scale. Table 4.1 provides the means and standard deviations for all of the variables used in the structural equations. This table offers a description of the low-SES students considered in this study. The information in the table will be discussed in detail as it relates to specific research questions. The correlation matrix of endogenous variables is located in Appendix B.

Table 4.1
Means and Standard Deviations for All Variables in the Model ($n = 437$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control variables</strong></td>
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<td></td>
</tr>
<tr>
<td>Gender (1 = male)</td>
<td>0.38</td>
<td>0.48</td>
</tr>
<tr>
<td>White (1 = yes)</td>
<td>0.42</td>
<td>0.49</td>
</tr>
<tr>
<td><strong>Background variables</strong></td>
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<td></td>
</tr>
<tr>
<td>Parents' income (in $10,000)</td>
<td>2.07</td>
<td>1.81</td>
</tr>
<tr>
<td>Parents' education$^a$</td>
<td>1.21</td>
<td>0.57</td>
</tr>
<tr>
<td>High school GPA$^b$</td>
<td>5.98</td>
<td>1.02</td>
</tr>
<tr>
<td>SAT composite score</td>
<td>836.45</td>
<td>196.59</td>
</tr>
<tr>
<td><strong>Economic variables</strong></td>
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<td></td>
</tr>
<tr>
<td>Grant/budget ratio</td>
<td>0.40</td>
<td>0.26</td>
</tr>
<tr>
<td>Loan/budget ratio</td>
<td>0.16</td>
<td>0.16</td>
</tr>
<tr>
<td>Work study/budget ratio</td>
<td>0.02</td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Aspiration variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree aspirations (1996)$^c$</td>
<td>5.27</td>
<td>1.98</td>
</tr>
<tr>
<td>Degree aspirations (1998)$^c$</td>
<td>5.25</td>
<td>1.54</td>
</tr>
<tr>
<td><strong>Integration variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic integration$^d$</td>
<td>197.37</td>
<td>47.43</td>
</tr>
<tr>
<td>Social integration$^d$</td>
<td>168.79</td>
<td>39.85</td>
</tr>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree attainment (1 = yes)</td>
<td>0.49</td>
<td>0.50</td>
</tr>
</tbody>
</table>

$^a$Scale: 1 = high school diploma or less, 2 = some postsecondary education, 3 = bachelor's degree, 4 = postbaccalaureate degree

$^b$Scale: 1 = D- to D, 2 = D to C-, 3 = C- to C, 4 = C to B-, 5 = B- to B, 6 = B to A-, 7 = A- to A

$^c$Scale: 0 = don’t know, 1 = less than 4 years/no degree or certificate, 2 = certificate, 3 = associate’s degree, 4 = bachelor’s degree, 5 = completion of postbaccalaureate program, 6 = master’s degree, 7 = advanced degree/doctoral or first professional

$^d$Scale: Mean response to individual items in index multiplied by 100. Items ask respondents how often they had done specific activities (See Appendix A). 1 = never, 2 = sometimes, 3 = often
Structural Equation Model

The proposed model described in Chapter Three was tested using Structural Equation Modeling (SEM). SEM follows a confirmatory approach to data analysis by testing the specified patterns among variables. The proposed structural regression model examined links among the variables in the study and tested the plausibility of assertions about the explanatory relationships among multiple variables.

The data were examined for both univariate and multivariate normality. Although several variables (e.g., parents' education, parents' income, work study/budget ratio) displayed univariate non-normality, recent research has shown that the maximum likelihood (ML) method of parameter estimation can be used with minor deviations from normality (Bollen, 1989; Raykov & Widaman, 1995).

Before model testing, a review of the descriptive statistics indicated the need to modify the hypothesized model. First, the proposed model included the latent construct SES, which used parents' education level and parents' income as indicators of the underlying construct. A statistically significant negative correlation between parents' education level and parents' income ($r = -0.23$), indicated that these two variables could not be used to measure a single construct. A close examination of the data determined that this correlation was not due to extreme cases. Accordingly, the two variables were considered separately as individual exogenous factors in a revised model. This revised model resembles a path analysis in that each explanatory variable is an observed variable instead of a latent construct and is assumed to have no measurement error. The model fitting procedure using SEM, however, considers all model equations simultaneously (Raykov & Marcoulides, 2000). Because there were no
latent constructs in the revised model, there is no consideration of a measurement model in this analysis.

Analysis of the descriptive statistics also indicated the need for a second change in the proposed model. In the proposed model the financial variables were exogenous factors. Both the descriptive statistics for this study and previous research indicate that financial aid variables are correlated with demographic characteristics such as SES, high school GPA, and standardized test scores. Accordingly, the proposed model was modified to include these important relationships between demographic characteristics and endogenous financial aid variables.

The revised model is presented in Figure 4.1. The rectangle labeled financial aid variables represents three separate variables: grant/budget ratio, loan/budget ratio, and work-study/budget ratio. These three ratios are not considered as a single variable; however, to facilitate ease of reading the model and understanding the hypothesized paths, these variables are represented in this manner.

In addition, several variables used in the analysis were scaled to adjust for differences in standard deviations among the variables in the model. The scaling procedure included adjustments to parents' income (divided value by 10,000), derived SAT score (divided by 100), academic integration (divided index score by 100), and social integration (divided index score by 100). The results from the SEM analysis are based upon these scaled scores.
Figure 4.1: Revised Causal Model of Degree Attainment

The hypothesized causal model was tested statistically to determine the extent to which the model was consistent with the data. The first inferential measure used was the chi-square goodness-of-fit index, which tests the null hypothesis that the model fits the analyzed covariance matrix perfectly. The $p$ value of the chi-square test leads to rejection of a model if the $p$ value is smaller than the preset significance level (i.e., 0.05), and retention of the model if the $p$ value is greater than the preset significance level (Raykov & Marcoulides, 2000). The chi-square value for the overall model was 193.34 ($p < 0.00, df = 40$). This value suggested
that the fit of the data to the hypothesized model was not entirely adequate. However, the sensitivity of this test to sample size and its basis on the $\chi^2$ distribution, which assumes that the model fits perfectly to the population, have led to criticism of this single fit measure (Byrne, 2001). When the sample size is large, it is recommended that in addition to a chi-square ($\chi^2$) statistic, researchers also should consider the goodness-of-fit index (GFI) and the root mean square residual (RMR), because of an artificial tendency to reject the model even if only marginally inconsistent with the data (Byrne, 2001; Stage, 1990).

The goodness-of-fit index (GFI) offers a measure of the relative amount of variance and covariance in the sample covariance matrix that is explained by the model (similar to $R^2$ in a regression analysis). Hu and Bentler (1995) classified GFI as an absolute index of fit because it compares the hypothesized model with no model at all. The adjusted goodness-of-fit index (AGFI) takes the number of parameters into account (Raykov & Marcoulides, 2000). The indices ranges from zero to 1.00, with values closer to 1.00 indicating a good fit (Byrne, 2001). The GFI was 0.94, and the AGFI was 0.85.

The standardized root mean square residual (RMR) represents an average residual value for all residuals. The value ranges from zero to 1.00, with a value less than 0.05 for a well-fitting model (Byrne, 2001). The standardized (RMR) was 0.067.

A different set of goodness-of-fit statistics is classified as incremental or comparative indices (Hu & Bentler, 1995). While the GFI and AGFI compare the model to no model, the normed fit index (NFI) and comparative fit index (CFI) compare the fit of a given model to the null model when all variables are constrained to be independent of each other (Raykov & Marcoulides, 2000). Values for both indices range from zero to 1.00, with a value greater
than .95 indicating a well-fitted model (Byrne, 2001). The NFI for the proposed model was 0.75 and the CFI was 0.77.

Several goodness-of-fit measures, including the chi-square, AGFI, standardized RMR, NFI, and CFI values, indicated that the model was not consistent with the data. Modification indices offer information that helps to correct the model by identifying potential missing paths or parameters that involve unnecessary constraints. In examining the parameter estimates for the model, the modification indices revealed that a large reduction in the chi-square value could be expected with an adjustment to the proposed model by eliminating proposed paths or parameters that were not statistically significant and by adding paths not included in the proposed causal model. Examples of additional paths include direct paths from high school GPA, SAT score, academic integration, and social integration to degree attainment. Additional paths suggested through modification indices were added if they were supported by previous literature.

The revised model (Figure 4.1) was tested to determine the extent to which the modified model was consistent with the data. The chi-square for the overall model was 75.36 ($p = .09$, $df = 60$). Several other goodness-of-fit indexes indicated that the revised model offered a plausible explanation of the relationships among the variables. These indexes included GFI (0.98), AGFI (0.96), and the standardized RMR (0.042). Based upon the GFI and the AGFI, the revised model fit the sample data fairly well. The standardized RMR indicated that the model explained the correlations to within an average error of 0.042 (Hu & Bentler, 1995). The NFI value (0.90) and the CFI value (0.98) also supported the fit of the model.
The last fit index discussed here is the root mean square error of approximation (RMSEA). The RMSEA uses the error of approximation in the population by considering, "How well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available?" (Browne & Cudek, 1993, pp. 137-138). The index is sensitive to the complexity of the model based upon the number of estimated parameters. Values less than .05 indicate good fit (Byrne, 2001). The RMSEA for the revised model was 0.023. The 90% confidence interval for the RMSEA was 0.00 to 0.039, and the p-value for the test of close fit was 1.00, indicating that the RMSEA value reflected a model that fit the population (Byrne).

Table 4.2 provides a comparison of the goodness-of-fit indices for both the proposed and the final causal models used in this study. Interested readers should view Appendix C for additional goodness-of-fit indices, which are not discussed above.

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>$df$</th>
<th>$p$-value</th>
<th>GFI</th>
<th>AGFI</th>
<th>Standardized NFI</th>
<th>Standardized CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed</td>
<td>193.34</td>
<td>40</td>
<td>0.00</td>
<td>0.94</td>
<td>0.85</td>
<td>0.076</td>
<td>0.75</td>
<td>0.77</td>
</tr>
<tr>
<td>Final</td>
<td>75.36</td>
<td>60</td>
<td>0.09</td>
<td>0.98</td>
<td>0.96</td>
<td>0.042</td>
<td>0.90</td>
<td>0.98</td>
</tr>
</tbody>
</table>

In addition to fit indices, LISREL provides a Q-Q (quartile-quartile) plot to assist researchers in assessing if the residuals are normally distributed. Recall that the residuals are defined as the discrepancy between the proposed model and the observed data. Hayduk (1987) explained that the "standardized residuals are estimates of the number of standard deviations the observed residuals are away from the zero residuals that would be provided by
a perfectly fitting model” (p. 170). Analysis of the Q-Q plot indicated that the standardized residuals were normally distributed, providing an additional indication of good model fit.

In summary, it is important to understand that while global fit indices and the Q-Q plot help to measure how well a model fits the sample data, it is still possible for a model to fit well yet be specified incorrectly (Byrne, 2001). Fit indices offer information regarding a model’s lack of fit, but do not reflect whether or not a model is plausible (Byrne). Therefore, it is important that model adequacy is evaluated through multiple criteria, including theoretical, statistical, and practical considerations. The indices discussed above do support the use of the revised model for multivariate analysis. The remaining sections of this chapter rely on both the descriptive statistics and the multivariate analysis to answer the proposed research questions.

Analyses of Research Questions

Before discussing the results of the data analyses relevant to the research questions, it is helpful to provide an overview of the statistics discussed below. In the LISREL output, beta depicts causal relationships between the endogenous variables, and gamma depicts causal relationships between exogenous and endogenous variables. The beta and gamma values reported below are standardized structural regression coefficients that are equivalent to path coefficients in a path analysis (Stage, 1990). These standardized regression coefficients are interpreted at the estimated change in the dependent variable, “expressed in standard deviation units, associated with a one standard deviation change in each independent variable, holding the other independent variables constant” (Mertler & Vannatta, 2001, p. 200). Within the LISREL analysis it is possible to estimate the relationships between endogenous constructs through psi parameters, which indicate noncausal relationships or
structural correlations. The discussion of the results indicates both direct and indirect causal effects among the variables. An indirect effect occurs when a variable affects an endogenous variable through an effect on another intervening variable (Agresti & Finlay, 1997). Direct effects go directly from one exogenous or endogenous variable to an endogenous variable. The combination of direct and indirect effects represents the total effect of the explanatory variable on a dependent variable.

**SES Influence**

The first research question asked, “How does low-SES influence baccalaureate degree attainment?” This study followed a conceptual framework that considered students’ baccalaureate degree attainment as a multiple-stage, longitudinal process. Following the socialization perspective, it is important to consider students’ background characteristics as a central element that shapes students’ educational opportunities. At this point, it is helpful to provide a description of the SES of the sample population. Two separate measures were used to examine SES: parents’ education level and parents’ income. The mean education level for low-SES students’ parents was a high school diploma (1.21). Less than 15% of the low-SES students’ parents in this study earned more than a high school diploma. Only 5.4% of the low-SES parents received a bachelor’s or postbaccalaureate degree. The mean income level of parents was $20,722. Looking at the distribution of income, however, indicates that median income was $15,866 with one-fourth of the parents earning less than $9,375. Recall that the sample for this study consists of students who were categorized as moderately to highly disadvantaged in terms of SES. The information above describes the lack of parents’ firsthand collegiate experiences and the significant financial challenges facing low-SES families.
The proposed causal model hypothesized that low-SES students' gender, ethnicity, and SES would influence their early academic achievement, measured by high school GPA and SAT test scores. For the low-SES students in this study, the mean high school GPA was equivalent to a “B or A-”, with nearly three-quarters of students reporting either an “A” or “B” average. Students’ mean standardized composite test score for the SAT was 836.45. The lowest quartile scored below 690, while the highest quartile scored above 980 out of a possible 1600 points. Both of the control variables considered in the study had statistically significant direct effects on SAT scores. Results of the multivariate analysis indicated that males and White students were more likely to have higher SAT scores (gamma = 0.13 and 0.35, respectively). While the self-reported high school GPA was relatively high, the SAT scores indicated that the low-SES students in this study may have a low level of “academic resources” (Adelman, 1999).

Table 4.3 displays the statistically significant total effects (direct + indirect effects) of the two SES variables (parents’ education and parents’ income) on subsequent variables in the model. All significant paths were estimated in computing effect coefficients. Results indicated that neither parents’ income, nor parents’ education, had a significant impact on low-SES students’ high school GPA, standardized test scores, or academic aspirations. However, parents’ education and income were found to have an effect on low-SES students’ financial aid, social and academic integration, and degree attainment. Increases in parental education and income had direct effects on various financial aid measures. Low-SES students who had parents with higher levels of education were less likely to have loans (gamma = -0.11). As parental income increased, low-SES students were less likely to have grants (gamma = -0.37) or work-study (gamma = -0.13). Regarding social and academic integration,
the results indicate that SES has a significant effect on students' experiences in college. Parents' education had a significant direct effect on social integration (gamma = 0.14), while parents' income had a significant indirect effect on academic and social integration (-0.05 and -0.07, respectively). Increases in parental education were associated with greater social integration, while increases in parental income were associated with lower academic and social integration. Finally, the results indicated that both parental education and parental income have a significant indirect effect on degree attainment. Similar to the influence of SES on integration variables, increases in parental education had a positive indirect effect on degree attainment (0.04), while increases in parental income had a negative indirect effect on degree attainment (-0.01).

Table 4.3
Significant Total Effect Coefficients of Parents' Education and Income on Endogenous Variables

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Endogenous Variable</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents' education</td>
<td>Loan/budget ratio</td>
<td>-0.11</td>
<td>-</td>
<td>-0.11</td>
<td>-2.32</td>
</tr>
<tr>
<td></td>
<td>Social integration</td>
<td>0.14</td>
<td>0.14</td>
<td>0.04</td>
<td>3.23</td>
</tr>
<tr>
<td></td>
<td>Degree attainment</td>
<td>*</td>
<td>0.04</td>
<td>0.04</td>
<td>2.51</td>
</tr>
<tr>
<td>Parents' income</td>
<td>Grant/budget ratio</td>
<td>-0.37</td>
<td>-</td>
<td>-0.37</td>
<td>-8.55</td>
</tr>
<tr>
<td></td>
<td>Work-study/budget ratio</td>
<td>-0.13</td>
<td>-</td>
<td>-0.13</td>
<td>-2.62</td>
</tr>
<tr>
<td></td>
<td>Academic integration</td>
<td>*</td>
<td>-0.05</td>
<td>-0.05</td>
<td>-2.61</td>
</tr>
<tr>
<td></td>
<td>Social integration</td>
<td>*</td>
<td>-0.07</td>
<td>-0.07</td>
<td>-3.78</td>
</tr>
<tr>
<td></td>
<td>Degree attainment</td>
<td>*</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-2.60</td>
</tr>
</tbody>
</table>

*Indicates no hypothesized effect

Aspirations

The second research question asked, “How do low-SES students’ degree aspirations influence baccalaureate degree attainment?” As discussed in Chapter Two, the formation of
educational aspirations is of primary interest to researchers using a status attainment perspective because aspirations can serve as intervening variables that mediate the influence of previous background characteristics and experiences on educational attainment. To explore the educational aspirations of low-SES students and the influence of aspirations on degree attainment, the following paragraphs describe the degree aspirations of the sample population, examine factors that had significant effects on degree aspirations, and examine the effects of aspirations on institutional integration and degree attainment.

The average degree aspiration in 1996 for the students in this study was a post-baccalaureate degree. Over 70% of the sample aspired to earn a degree higher than a bachelor's degree. One-fifth of the sample aspired to earn a bachelor's degree (20.1%), while nearly 10% reported not knowing their degree expectations. Students' degree aspirations in 1998 followed similar patterns. One-third of the students aspired to earn a bachelor’s degree. There was a slight decrease in the number of students aspiring to degrees higher than a bachelor’s degree, with 40.5% of the sample expecting to earn a master’s degree and nearly 20% of the sample expecting to earn a doctoral or first professional degree (total = 60.4%). In summary, the low-SES students in this study began college with high degree expectations. After two years of enrollment in higher education, more students aspired to earn a bachelor’s degree, with fewer students reporting that they did not know their degree aspirations and fewer students reporting aspirations of a master’s or advanced degree.

Based upon previous research and theories, the hypothesized causal model presumed that students’ background characteristics and academic performance would have an effect on initial degree aspirations. Although the hypothesized model predicted that several student background characteristics would predict educational aspirations, only ethnicity had a
significant influence on low-SES students' degree aspirations in 1996. The direct effect of
ethnicity on initial degree aspirations (gamma = -0.16) indicates that students of color were
more likely to have higher degree aspirations compared to White students. No support was
found for the presumed effect of high school GPA or SAT scores on initial educational
aspirations. Similarly, financial aid ratios did not have a significant effect on students' initial
degree aspirations in 1996.

The causal model also posited that previous academic performance, financial aid
factors, degree aspirations, and institutional integration would influence subsequent degree
aspirations in 1998. One exogenous variable, gender, did have a significant effect on later
degree aspirations. Gender had a significant indirect effect on 1998 degree aspirations (0.03),
indicating that males tended to have higher degree aspirations. Several endogenous variables
had a direct influence on 1998 degree aspirations including high school GPA (beta = 0.10),
SAT (beta = 0.18), and academic integration (beta = 0.13). Results indicated that the
grant/budget ratio had an indirect effect on 1998 degree aspirations (0.02).

The results indicated that low-SES students' initial degree aspirations and subsequent
degree aspirations were significant in explaining degree attainment. Students' initial degree
aspirations in 1996 were associated with 1998 degree aspirations (beta = 0.29) and degree
attainment (indirect effect = 0.06). Students with higher degree aspirations in 1998 were
more likely to earn a degree (beta = 0.17). The statistically significant effect coefficients
(total effects) for the structural model concerning variables related to educational aspirations
are summarized in Table 4.4.
Table 4.4
Significant Total Effect Coefficients of Exogenous and Endogenous Variables Related to Education Aspirations

<table>
<thead>
<tr>
<th>Endogenous Variable</th>
<th>Predictor Variable</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirations 1996</td>
<td>Ethnicity</td>
<td>-0.16</td>
<td></td>
<td>-0.16</td>
<td>-3.38</td>
</tr>
<tr>
<td>Aspirations 1998</td>
<td>Gender</td>
<td>*</td>
<td>0.03</td>
<td>0.03</td>
<td>2.55</td>
</tr>
<tr>
<td></td>
<td>High school GPA</td>
<td>0.10</td>
<td></td>
<td>0.10</td>
<td>2.23</td>
</tr>
<tr>
<td></td>
<td>SAT score</td>
<td>0.18</td>
<td>0.03</td>
<td>0.21</td>
<td>4.27</td>
</tr>
<tr>
<td></td>
<td>Grant/budget ratio</td>
<td>*</td>
<td>0.02</td>
<td>0.02</td>
<td>1.99</td>
</tr>
<tr>
<td></td>
<td>Aspirations 1996</td>
<td>0.29</td>
<td>0.01</td>
<td>0.30</td>
<td>6.81</td>
</tr>
<tr>
<td></td>
<td>Academic integration</td>
<td>0.13</td>
<td></td>
<td>0.13</td>
<td>2.90</td>
</tr>
<tr>
<td>Degree Attainment</td>
<td>Degree aspirations (1996)</td>
<td>*</td>
<td>0.06</td>
<td>0.06</td>
<td>3.60</td>
</tr>
<tr>
<td>Degree Attainment</td>
<td>Degree aspirations (1998)</td>
<td>0.17</td>
<td></td>
<td>0.17</td>
<td>3.87</td>
</tr>
</tbody>
</table>

*Indicates no hypothesized effect

Financial Aid

The third research question asked, "How does financial aid affect the degree attainment of low-SES students?" It is important to first provide descriptive statistics to characterize the financial aid received by students in the sample population. Each of the financial aid measures (grants, loans, work-study) is a ratio calculated by dividing the financial aid amount by the total student budget. For the grant/budget ratio, the mean was 0.40 (SD = 0.26). Out of the 437 students in the sample, 52 did not receive grant aid. For the loan/budget ratio, the mean was 0.16 (SD = 0.16). Many students (n = 162) did not receive loan aid. The mean work study/budget ratio was 0.03 (SD = 0.06), with over 75% of students not receiving work study aid. Psi coefficients were examined to discern statistically
significant noncausal relationships among the financial variables considered in this study. The structural correlation between grants and loans was -0.11 and between grants and work-study was 0.11. There was no statistically significant correlation between loans and work-study. The results indicated a statistically significant correlation between students' SAT scores and grant/budget ratio ($\psi = 0.22$) and a statistically significant correlation between students high school GPA and grant/budget ratio ($\psi = 0.19$).

Analysis of the causal model provided insights regarding the influence of financial aid on other endogenous variables and degree attainment. Results indicated that none of the financial aid ratios were related to students' initial degree aspirations. In addition, only the grant/budget ratio had a significant influence on subsequent variables. Specifically, the grant/budget ratio had a direct effect on both academic integration (beta = 0.13) and social integration (beta = 0.19). The grant/budget ratio also had an indirect effect on students' 1998 degree aspirations (0.02) and degree attainment (0.03).

*Social and Academic Integration*

The fourth research questions asked, "How does students' social and academic integration influence low-SES students' baccalaureate degree attainment?" The causal model proposed in Chapter Three examined how students' integration into the social and academic spheres of campus life may be influenced by students' background characteristics and experiences before college. The model also explored the influence of financial aid and educational aspirations on academic and social integration. Finally, the model hypothesized that both social and academic integration would influence degree attainment through students' subsequent degree aspirations.
Before discussing the causal model analysis, it is helpful to gain an understanding of the academic and social integration perceptions of the low-SES students considered in this study. The measures of both social and academic integration were indices used to indicate the level of integration respondents experienced at their college during the 1995-1996 academic year. The mean for individual items discussed earlier in this chapter were multiplied by 100 to compute an index score. The average social integration index was 168.79 ($SD = 39.85$). The average academic integration index was 197.37 ($SD = 47.43$). Considering the scale for the individual items in the integration indices (1 = never, 2 = sometimes, 3 = often), the mean academic and social integration indices suggest that, on average, low-SES students reported engaging in the associated behaviors (i.e., participating in study groups, social contact with faculty, meeting with academic advisor, talking with faculty about non-academic matters, attending fine arts activities, participating in sports, participating in school clubs, and going to places with friends from school) “sometimes.”

The proposed causal model allowed an exploration of the influence of several factors on students’ academic and social integration. Of particular interest was the influence of both economic factors and students’ educational aspirations on integration. Analysis of the causal model indicated that one financial aid factor had a significant direct effect on academic and social integration. Specifically, the grant/budget ratio had a positive direct effect on academic integration ($\beta = 0.13$) and social integration ($\beta = 0.19$). The control variable ethnicity had a direct effect on social integration ($\beta = 0.16$), indicating that White students were more likely than students of color to report higher levels of social integration. The proposed model hypothesized that students’ initial educational aspirations would have an effect on students’ academic and social integration. Results of the causal model analysis indicated that
initial educational aspirations did not have an effect on academic or social integration. Similarly, no support was found for the presumed effect of high school GPA on academic integration.

Several factors also had a statistically significant indirect effect on academic and social integration. As mentioned earlier in this chapter, parents' income had a negative indirect effect on academic integration (-0.05) and a negative indirect effect on social integration (-0.07). Parents' education level had a positive direct effect on social integration (gamma = 0.14), while parents' income level had a negative effect on social integration (indirect effect = -0.07).

The causal model explored in this study hypothesized that academic integration and social integration primarily influence degree attainment through students' educational aspirations. More specifically, it was hypothesized that students' levels of academic and social integration in 1995-1996 would have a direct influence on educational aspirations in 1998 and a direct influence on degree attainment. Analysis of the SEM results indicated that academic integration had a direct effect on students' 1998 degree aspirations (beta = 0.13) and a direct effect on degree attainment (beta = 0.08). Social integration did not have a significant effect on 1998 degree aspirations, but did have a direct effect on degree attainment (beta = 0.10). Table 4.5 provides a summary of total effects (direct + indirect) for endogenous variables related to both academic and social integration.

Psi coefficients were analyzed to determine the nature of the noncausal relationship between academic integration and social integration. The statistically significant structural correlation between academic and social integration (psi = 0.29) indicates that higher levels of academic integration are associated with higher levels of social integration.
**Table 4.5**
Significant Total Effect Coefficients of Exogenous and Endogenous Variables Related to Academic and Social Integration

<table>
<thead>
<tr>
<th>Endogenous Variable</th>
<th>Predictor Variable</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
<th>t-value total effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic integration</td>
<td>Parents' income</td>
<td></td>
<td>-0.05</td>
<td>-0.05</td>
<td>-2.61</td>
</tr>
<tr>
<td>Grant/budget ratio</td>
<td>0.13</td>
<td></td>
<td>-</td>
<td>0.13</td>
<td>2.74</td>
</tr>
<tr>
<td>Social integration</td>
<td>Ethnicity</td>
<td>0.16</td>
<td>-</td>
<td>0.16</td>
<td>3.66</td>
</tr>
<tr>
<td>Parents' education</td>
<td>0.14</td>
<td>-</td>
<td>0.14</td>
<td>3.23</td>
<td></td>
</tr>
<tr>
<td>Parents' income</td>
<td>*</td>
<td>-0.07</td>
<td>-0.07</td>
<td>-3.78</td>
<td></td>
</tr>
<tr>
<td>Grant/budget ratio</td>
<td>0.19</td>
<td>-</td>
<td>0.19</td>
<td>4.21</td>
<td></td>
</tr>
<tr>
<td>Degree aspirations</td>
<td>Academic integration</td>
<td>0.13</td>
<td>-</td>
<td>0.13</td>
<td>2.90</td>
</tr>
<tr>
<td>(1998)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree attainment</td>
<td>Academic integration</td>
<td>0.08</td>
<td>0.02</td>
<td>0.10</td>
<td>2.08</td>
</tr>
<tr>
<td>Social integration</td>
<td>0.10</td>
<td>-</td>
<td>0.10</td>
<td>2.19</td>
<td></td>
</tr>
</tbody>
</table>

*Indicates no hypothesized effect

**Interaction of Factors**

The fifth research question asked, "How do SES, degree aspirations, financial resources, academic integration, and social integration interact to influence degree attainment for low-SES students?" The discussion of the previous research questions provides insights into this research question; however, the structural relations can be modeled pictorially to enable a clearer conception of the elaborated theory of socialization that is under study.

Figure 4.2 provides an illustration of the significant direct effects between exogenous and endogenous variables in the causal model.
To discuss how multiple variables interact to influence degree attainment, it is useful first to discuss the variables that had a statistically significant direct effect on degree attainment for low-SES students. As seen in Figure 4.2, several variables had a direct effect on degree attainment. In order of effect size, these variables include high school GPA (beta = 0.24), 1998 educational aspirations (beta = 0.17), SAT (beta = 0.12), social integration (beta = 0.10), and academic integration (beta = 0.08). The following paragraphs discuss what
additional factors contribute to these specific variables that had a direct effect on degree attainment.

*High school GPA.* None of the hypothesized exogenous variables had a direct effect on students’ high school GPA. The psi coefficient indicated that there was a significant correlation between students’ high school GPA and SAT scores ($\psi = 0.36$).

*1998 educational aspirations.* Several variables had a direct effect on students’ 1998 educational aspirations, including SAT scores, high school GPA, 1996 educational aspirations, and academic integration. Not surprisingly, students with higher previous academic performance had higher educational aspirations in 1998. However, this same influence was not noted for students’ initial degree aspirations in 1996. It also is not surprising that students’ initial degree aspirations are related to their subsequent aspirations. The results indicated that academic integration has a direct effect on students’ educational aspirations.

*SAT scores.* Both of the control variables had a significant direct effect on students’ SAT scores. White students and male students tended to have higher SAT scores ($\gamma = 0.35$ and $\gamma = 0.13$, respectively).

*Social integration.* One exogenous variable and one endogenous variable had a direct effect on students’ levels of social integration. As mentioned earlier, ethnicity had a direct effect on social integration ($\gamma = 0.16$), with white students being more likely to have higher levels of social integration. Students’ grant/budget ratio had a positive direct effect on social integration ($\beta = 0.19$), indicating that higher grant ratios were associated with higher levels of social integration.
*Academic integration.* Similar to social integration, students' grant/budget ratio had a positive direct effect on academic integration (beta = 0.13). Again, higher grant/budget ratios were associated with higher levels of academic integration.

Table 4.6 reports the statistically significant total effects (direct + indirect effects) of exogenous and endogenous variables on the dependent variable of degree attainment. Coupled with Figure 4.2, this table allows for an interpretation of how various variables might mediate the influence of other endogenous variables on degree attainment. In other words, it is possible to follow the significant direct effects illustrated in Figure 4.2 to determine the intermediate variables in the significant indirect effects.

The significant indirect effects on degree attainment included several exogenous and endogenous variables. Both of the control variables had significant indirect effects on degree attainment. The indirect effect of gender was through students' SAT scores. The indirect effect of ethnicity on degree attainment was through SAT scores and social integration; there was no indirect effect of ethnicity on 1998 degree aspirations. Parents' income had an indirect effect on degree attainment through the grant/budget ratio. In turn, the grant/budget ratio had an indirect effect on degree attainment through both academic and social integration. Several variables, including high school GPA, SAT scores, 1996 degree aspirations, and academic integration, had an indirect effect on degree attainment through 1998 degree aspirations.
Table 4.6
Significant Total Effect Coefficients of Predictor Variables for Degree Attainment

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Predictor Variable</th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
<th>t-value total effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree attainment</td>
<td>Gender</td>
<td>-0.14</td>
<td>0.02</td>
<td>-0.12</td>
<td>-2.71</td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
<td>-</td>
<td>0.06</td>
<td>0.06</td>
<td>3.14</td>
</tr>
<tr>
<td></td>
<td>Parents’ income</td>
<td>*</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-2.60</td>
</tr>
<tr>
<td></td>
<td>Parents’ education</td>
<td>*</td>
<td>0.04</td>
<td>0.04</td>
<td>2.51</td>
</tr>
<tr>
<td></td>
<td>High school GPA</td>
<td>0.24</td>
<td>0.02</td>
<td>0.26</td>
<td>5.48</td>
</tr>
<tr>
<td></td>
<td>SAT score</td>
<td>0.12</td>
<td>0.04</td>
<td>0.16</td>
<td>3.43</td>
</tr>
<tr>
<td></td>
<td>Grant/budget ratio</td>
<td>*</td>
<td>0.03</td>
<td>0.03</td>
<td>2.73</td>
</tr>
<tr>
<td></td>
<td>Degree aspirations 1996</td>
<td>*</td>
<td>0.06</td>
<td>0.06</td>
<td>3.60</td>
</tr>
<tr>
<td></td>
<td>Academic integration</td>
<td>0.08</td>
<td>0.02</td>
<td>0.10</td>
<td>2.08</td>
</tr>
<tr>
<td></td>
<td>Social integration</td>
<td>0.10</td>
<td>-</td>
<td>0.10</td>
<td>2.19</td>
</tr>
<tr>
<td></td>
<td>Degree aspirations 1998</td>
<td>0.17</td>
<td>-</td>
<td>0.17</td>
<td>3.87</td>
</tr>
</tbody>
</table>

*Indicates no hypothesized effect

Table 4.7 summarizes the total effects for all of the variables in the final reduced path model. The table also includes the $R^2$ value for each endogenous variable, which indicates the percentage of variance in the endogenous variable explained by the final model.
Table 4.7
Significant Unstandardized Total Effect Coefficients for the Final Structural Model

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.52**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.09*</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>1.38**</td>
<td></td>
<td>-0.64**</td>
<td></td>
<td></td>
<td>0.13**</td>
<td></td>
<td></td>
<td></td>
<td>0.05</td>
</tr>
<tr>
<td>Parents' education</td>
<td></td>
<td>-0.03*</td>
<td></td>
<td></td>
<td></td>
<td>0.10**</td>
<td>0.02</td>
<td>0.03*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents' income</td>
<td></td>
<td>-0.05**</td>
<td></td>
<td></td>
<td></td>
<td>-0.01**</td>
<td>-0.02**</td>
<td>-0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school GPA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grant/budget ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loan/budget ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-study/budget ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree aspirations 1996</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree aspirations 1998</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ R^2 = 0.15 \quad 0.13 \quad 0.01 \quad 0.02 \quad 0.03 \quad 0.02 \quad 0.09 \quad 0.17 \quad 0.20 \]

*p < .05, **p < .01 two-tailed
Often the effect of an independent variable on a dichotomous outcome such as degree attainment is represented by an odds ratio. An odds ratio is defined as a ratio of the odds of being classified in one category of the dependent variable for different values of the independent variable (Mertler & Vannatta, 2001). In the case of this study, the odds ratio represents the increase (or decrease if the value is less than one) in odds of earning a baccalaureate degree when the predictor variable increases by one (Mertler & Vannatta).

Table 4.8 presents the odds ratios for each of the variables that had a direct effect on degree attainment. For comparison purposes, the table provides two odds ratios. The model odds ratio provides the odds of earning a baccalaureate degree when the predictor variable increases by one, while considering other variables within the causal model. Six binary logistic regressions were calculated, considering each predictor variable and degree attainment. The binary logistic regression odds ratio considers the odds of earning a baccalaureate degree when the predictor variable increases by one and is independent of other variables within the causal model.

Comparison of the model odds ratios and the binary logistic regression odds ratios indicates that with the exception of gender, the variables present in the causal model mitigate the individual influence of each predictor variable. In other words, compared to the logistic regression odds ratios, the model odds ratios are closer to one, which indicates that there is less of an increase in the likelihood of graduating associated with an increase in each individual predictor variable when other variables in the model are considered as well. The odds ratios for high school GPA \((e^\beta = 1.62)\) and social integration \((e^\beta = 1.62)\) indicate that as these predictor values increase by one, the odds of earning a bachelor’s degree increase by the respective ratio. These two odds ratios represent the largest ratios. The odds ratio for
gender indicates that low-SES males are 0.57 times as likely to earn a bachelor's degree than not earn a bachelor's degree, compared to females. Increases in academic integration \( (e^{\beta} = 1.38) \) also increase the likelihood of graduating. Table 4.8 includes the standardized \( \beta \) coefficients, which provide a clearer understanding of the rank order of predictor variables. This is particularly useful considering that both academic and social integration are scaled scores, which can influence the interpretation of the odds ratios.

Table 4.8
Standardized Direct Effect Coefficients, Model Odds Ratios, and Logistic Regression Odds Ratios of Predictor Variables for Degree Attainment

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Standardized ( \beta )</th>
<th>Model Odds Ratio</th>
<th>Binary Logistic Regression Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-0.14</td>
<td>0.57</td>
<td>0.53</td>
</tr>
<tr>
<td>High school GPA</td>
<td>0.24</td>
<td>1.62</td>
<td>2.16</td>
</tr>
<tr>
<td>SAT score</td>
<td>0.12</td>
<td>1.13</td>
<td>1.32</td>
</tr>
<tr>
<td>Academic integration</td>
<td>0.08</td>
<td>1.38</td>
<td>2.01</td>
</tr>
<tr>
<td>Social integration</td>
<td>0.10</td>
<td>1.62</td>
<td>2.54</td>
</tr>
<tr>
<td>Degree aspirations (1998)</td>
<td>0.17</td>
<td>1.27</td>
<td>1.51</td>
</tr>
</tbody>
</table>

The findings from the data analyses in this study provide valuable information regarding the individual and collective influence of social, economic, and interactionalist factors on degree attainment of low-SES students. The results provide insights into the research questions of this study. In the next chapter, the data analyses results are discussed in an effort to detail an elaborated socialization theory of degree attainment.
CHAPTER 5
SUMMARY AND IMPLICATIONS

The purpose of this study was to develop an integrated understanding of how social, economic, and interactional factors affect degree attainment for low-SES students. This chapter examines these factors by discussing the results of this study using status attainment and social reproduction theories as an analytic framework to examine the interaction among multiple factors that influence degree attainment. This chapter first reviews the previous four chapters to provide a clear context for this study. A discussion of the individual influence of social, economic, and interactional factors on degree attainment follows. The collective influence of these perspectives is then considered by examining the implications for higher education theory and research. Lastly, this chapter considers the significance of the results for higher education practice.

Review of the Study

Chapter One describes the importance of baccalaureate degree attainment as part of the status attainment process with particular attention to the importance of degree attainment for low-SES students. This chapter provides an overview of several perspectives to understand baccalaureate degree attainment. While several studies have considered how socialization, economic, and interactional factors individually influence degree attainment, no studies integrate these perspectives to examine educational attainment as a dynamic and continual process. This study proposes to inform the scholarship of higher education by extending what is already known about degree attainment by incorporating both the economic and interactional theoretical perspectives in an elaborated socialization model of degree attainment.
The literature review in Chapter Two discussed the theoretical concepts of status attainment and social reproduction to provide an overview of the educational attainment process. The status attainment literature provides an important theoretical lens that examines the influence of social status, academic achievement, and critical intervening experiences on the process of social mobility. The status attainment theoretical lens is significant because it conceptualizes social mobility as a life cycle process. The second theoretical concept of social reproduction suggests that students from lower-SES groups have less capital (cultural, economic, social), which influences students' access to educational opportunities and shapes students' educational experiences. In addition, social reproduction indicates that low-SES students' habitus (system of outlooks and beliefs about the social world) may play an important role in students' formation of postsecondary plans, institutional involvement, and subsequent degree attainment. Together, the theories of status attainment and social reproduction provide a framework to discuss the possible interactions of the socialization, economic, and interactionalist degree attainment models.

Chapter Three detailed the data and methods used in this study and provided a hypothesized causal model of degree attainment based upon the literature reviewed in Chapter Two. The results of SEM testing of the proposed causal model were discussed in Chapter Four. These analyses provided support for integrating multiple perspectives when considering the degree attainment process of low-income students.

Degree Attainment Process

When coupled with previous research on degree attainment, the findings from this study help to explore low-SES students' degree attainment as a dynamic and ongoing process. The results from the SEM test of the causal model provide insights into how
socialization, economic, and interactionist factors individually and collectively influence degree attainment.

Socialization

Based upon the socialization model of status attainment, the causal model hypothesized that students’ SES, early academic achievement, and degree aspirations would individually and collectively influence degree attainment. The results of the data analyses offered support for several aspects of the socialization model.

SES. The socialization model of status attainment assumes that SES affects the support students receive, the formation of educational aspirations, and individuals’ degree attainment. Based upon previous research, the proposed model in this study assumed that parental income and education level would impact educational attainment. The most compelling finding regarding the effect of SES on the degree attainment process is that for the low-SES students in this study, parental income and education level did not affect students’ high school grade point average, standardized test scores, or initial degree aspirations. This finding contrasts with multiple studies that suggest parental education and income level are important in determining students’ educational outcomes (e.g., Anschaffenburg & Maas, 1997; Frehill, 2000; McDonough, 1997; Sewell et al., 1969).

Previous research on the degree attainment process offers several possible explanations for the finding that SES did not have an effect on early academic achievement and educational aspirations. It is important to note that the low-SES students in this study represent a distinct sample of low-SES students who successfully started postsecondary education. Indeed, these students already have overcome what Cabrera and La Nasa (2000) deemed as three critical tasks that low-SES students face: acquiring academic qualifications
for entering college, earning a high school degree, and applying and enrolling in a four-year institution of higher education. Despite the fact that the students in this study were classified as moderately to highly disadvantaged on a socioeconomic diversity scale, they maintained strong high school grade point averages and had high degree aspirations. Perhaps the students in this sample represent individuals who succeeded despite the relative disadvantages of their SES categorization.

Ethington (1990) suggested that compared to high-SES students, low-SES students who enroll in higher education institutions are more likely to perceive themselves as doing well in college and tend to place a greater value on college attendance. Perhaps by successfully overcoming several barriers to college entrance, the low-SES students in this study maintained or enhanced their degree aspirations. These high degree aspirations may mitigate the influence of family income and education on degree attainment (St. John et al., 1991).

A third possible explanation for the lack of effects of SES on students’ early academic achievement and degree aspirations is the possibility that SES may be related to other factors not considered in the model. Discussion of the general limitations of this study acknowledged that the model did not consider important variables that explain the relationship between SES and degree attainment, such as the influence of parents, peers, and teachers (Hossler & Stage, 1992; McDonough, 1997; Sewell, Haller, & Portes, 1969; Stage & Hossler, 1989). The presence of social networks in the form of encouragement from parents and teachers or support from peers, represents important experiences that may serve to mediate the influence of SES on students’ degree aspirations and degree attainment.
Lastly, it is important to consider the sample in this study for another reason. Recall that the sample consisted of students who were moderately or highly disadvantaged based upon an SES index that included measures of parental income and education. Therefore, the SES measures considered in this study do not have a large degree of variance. In other words, while SES measures did not explain differences in low-SES students' academic achievement and aspirations, these measures may explain differences in early academic achievement and aspirations when considering a sample that includes multiple SES categories.

*Early academic achievement.* The results of the SEM analysis indicate that students' early academic experiences are a significant factor in degree attainment. When ranking the direct effects of all the variables considered in the model on degree attainment, high school GPA was first and SAT test score ranked third. These results affirm previous research that suggests prior achievement has a strong effect on persistence and degree attainment (e.g., Allen, 1999; Ethington, 1990; Frehill, 2000). Both of the theoretical frameworks used in this study to understand degree attainment (status attainment and social reproduction), indicate that class status can place boundaries on the educational opportunities available to low-SES students. It may be that successful early academic achievement provides low-SES students with intellectual self-esteem (Astin, 1993). The discussion of aspirations that follows argues that this intellectual self-esteem may serve as a form of capital that shapes low-SES students' habitus regarding degree attainment.

It is important to note that while students' average self-reported high school GPA was relatively high, their mean SAT score was relatively low. Using data from the 1990 Beginning Postsecondary Studies Survey, Terenzini et al. (2001) reported that mean SAT for the lowest-SES quartile was 899 compared to 967 and 1010 for the two highest-SES
quartiles. The mean SAT score for the low-SES students in this study (836), represents a possible deficit in their preparedness for college study. The contrast between students’ self-reported GPA and test scores lends support for the use of Adelman’s (1999) measure of academic resources which considers test scores, class rank, academic GPA, and high school curriculum intensity. Within this measure, Adelman found that the intensity of students’ high school curriculum was the strongest predictor of baccalaureate degree attainment. Perhaps the discrepancy between students self-reported GPA and SAT test scores is related to the intensity of the high school curriculum, which is unknown in this study. Adelman’s finding that low-SES students with a high academic resource score earn bachelor’s degrees at a higher rate than a majority of students in the highest-SES quintile provides additional support for the relative importance of previous academic achievement for low-SES students.

Aspirations. The development of low-SES students’ aspirations is particularly important because a student’s aspirations can serve as important intervening variables that mitigate the influence of previous background characteristics. This study hypothesized that students’ early socialization experiences, educational achievement, and financial aid would influence low-SES students’ initial degree aspirations. The findings from this study failed to support the contention that educational aspirations are based upon family income (Cabrera & La Nasa, 2000; Trusty, 2000) and parental education level (Hossler & Stage, 1992; McDonough, 1997). However, the earlier discussion of SES provides possible explanations for these findings. While the findings differed from research that suggests financial aid influences students’ degree aspirations (Cabrera et al., 1990), other research has failed to demonstrate that financial aid influences degree aspirations (Cabrera et al., 1992).
Students' initial degree aspirations serve an important role in the degree attainment process. The findings of this study are consistent with previous research that indicates students' initial degree aspirations are the strongest predictor of subsequent educational aspirations (Pascarella, 1984). While the theoretical model hypothesized that several variables would influence initial degree aspirations, the only variable in the model that had a direct effect on students' initial degree aspirations was ethnicity, with students of color having higher degree aspirations. As noted in Chapter Four, the low-SES students in this study had high educational aspirations despite socioeconomic disadvantages. Clearly, more research is needed to determine the factors that shape low-SES students' initial degree aspirations.

Students' degree aspirations in their third academic year (1998) were a significant factor in degree attainment process. When ranking the direct effects of variables on degree attainment, only students' high school GPA had a larger direct effect. Based upon the socialization model of educational attainment, it was hypothesized that students' academic performance would have an effect on initial degree aspirations and an indirect effect on subsequent degree aspirations. The results of the SEM analysis indicated that academic performance did not have an effect on students' 1996 degree aspirations, but that students' high school GPA and SAT scores did have an effect on students' subsequent degree aspirations in 1998. While it was hypothesized that students' early academic achievement would influence their initial degree aspirations, the findings from this study indicate that students' early academic achievement may instead influence the development of students' degree aspirations. These findings lend partial support to other research that suggests high
school achievement is a strong predictor of postsecondary aspirations (Astin, 1993; Carter, 2002; Donovan, 1984; Hossler et al., 1999; Pascarella, 1984).

While the SEM results did not lend support for the contention that early academic performance influences students' initial degree aspirations, it may be that early academic performance represents a form of academic resources or academic confidence that helps to shape subsequent degree aspirations as students progress through college. This may be especially true if low-SES students tend to form high initial degree aspirations (Ethington, 1990). Students with high degree aspirations may revise their educational goals in light of their previous academic performance. It may be that students with strong academic skills or preparation are more likely to sustain initial high degree aspirations, while students with lower academic self-confidence are likely to lessen their degree aspirations. While McDonough (1997) defined habitus as a permanent set of outlooks, the finding that students' degree aspirations changed provides support for the perspective that aspirations are not static and that it is important to measure aspirations at multiple times to differentiate between the effects of early socialization and later socialization (Aschaffenburg & Maas, 1997).

To summarize, while the results of this study did not find evidence to suggest that SES shaped students' early academic performance or degree aspirations, there was support for other aspects of the socialization model of degree attainment. Specifically, the results indicate that both early academic experiences and degree aspirations have direct and indirect effects on degree attainment. Of all the variables considered in the model, students' high school GPA, SAT scores, and degree aspirations represented the variables with the largest effect on degree attainment, which indicates the continued importance of socialization experiences.
Economic theories of educational attainment are predicated upon the belief that retention and departure decisions are based upon the required financial resources and the expected economic benefits of earning a degree. This study considered it necessary to explicitly examine the effects of financial aid variables on degree attainment. These variables are particularly important in the degree attainment process of low-SES students, who because of their background, available resources, and habitus, may be less likely to believe that attainment of a baccalaureate degree is feasible.

The multivariate analysis results indicated that low-SES students’ grant/budget ratio had significant direct effects on academic and social integration and an indirect effect on degree attainment. This means that increases in students’ grant support were associated with an increase in students’ self-reported levels of academic and social integration. The finding that finances have a direct effect on low-SES students’ integration experiences is noteworthy. While Cabrera et al. (1990) posited that financial factors influence academic and social integration, they found no evidence to support this assertion. Similarly, Cabrera et al. (1992) hypothesized that the awarding of financial aid would have a positive effect on students’ academic and social integration; however they found support only for the effect of financial aid on social integration. This study differed from these previous studies in two important ways. First, this study concentrated on the specific effects of financial aid variables on low-SES students’ integration experiences. Second, this study explored the influence of different types of financial aid (i.e., grants, loans, work study) in an effort to examine the differential effect of financial aid type on institutional integration. The focus on low-SES students and consideration of various types of financial aid allowed this study to consider how students’
background characteristics and financial aid type might work together to impact the degree attainment process.

As explained in Chapter Two, previous studies on financial aid have focused on the ability of financial aid to equalize educational opportunity or the effectiveness of financial aid packages in promoting persistence. While several studies indicate that need-based aid is especially important for low-SES students' when making enrollment decisions (Leslie & Brinkman, 1988; St. John, 1990), there is less clarity regarding the influence of financial aid types on low-SES students' retention and degree attainment. For example, while Stampen and Cabrera (1988) found that financial aid promoted persistence among low-SES students, research also has indicated that grant amounts are negatively associated with persistence (St. John & Starkey, 1995). St. John and Starkey hypothesized that the negative relationship between grant amount and persistence was due to limits in grant funding at the time of the study that reduced the amount of the average grant award relative to the average tuition charge. Similar to Cabrera et al. (1990), the findings from this study indicate that for low-income students, increases in financial aid can also increase students' academic and social integration, which in turn, influences degree attainment. The findings also support prior research that suggests low-SES students are more responsive to grants compared to loans and work-study programs (Terenzini et al., 2001).

The research reported here has clear implications for the packaging of financial aid for low-SES students. The findings from this study support Astin's (1993) contention that grant aid is the only form of financial aid that seems to have measurable effects on student development. The focusing of need-based grant aid on low-SES students is especially important in assisting these students in becoming academically and socially integrated within
the institution. The finding that neither loan/budget or work study/budget ratios had an effect on low-SES students' integration experiences indicates that low-SES students may be particularly responsive to economic capital in the form of grant aid. Following economic theories of status attainment, grant aid may represent an economic resource that enhances low-SES students' evaluation of the economic costs versus benefits of earning a baccalaureate degree. Using Bourdieu's theoretical framework, Horvat (2001) argued that instead of viewing students' aspirations and degree attainment as individual behaviors, attention should be directed to the ways that educational systems structure individual's pathways. For example, scholars have noted the stratification of higher education, commenting that "one in six students from lower-or lower-middle-income families is currently enrolled at medium or highly selective four-year institutions, in contrast to over one out of two from the wealthiest families" (McPherson & Schapiro, 2000).

This trend is true for the students considered in this study, with nearly 70% of the sub-sample attending institutions classified as "least selective" (see Table 3.1). Hearn (1984) found that student placement into the hierarchy of higher education institutions is partly based on status characteristics such as SES. Financial aid policies may serve as important parts of educational systems that can address the stratification of higher education attendance patterns based on SES. The results of this study suggest that financial aid in the form of grants may serve as a form of economic capital that low-SES students convert into academic and social integration. Financial support in the form of grant aid may allow low-SES students to allocate more effort to academic and intellectual behaviors, interacting with faculty about academic and non-academic matters, and forming social networks within the institution.
The results of this study support what St. John et al. (1996) termed "the nexus between college choice and persistence" (p. 175). The phrase nexus indicates that the college choice and persistence processes are interconnected, which is an assertion that is supported through this study. The finding that students' grant/budget ratio had a direct effect on students' academic and social integration and an indirect effect on students' degree attainment suggests that there is indeed an interaction between finances and academic and social experiences. The grant/budget ratio considered in this study represents a financial aid measure during the students' first year of college. It seems that financial aid factors not only influence students' enrollment decisions (Paulsen & St. John, 1997), and persistence decisions (St. John et al.), but the interaction between finances and academic and social experiences also influences degree attainment behaviors.

In summary, the results from this study indicate that grant aid is an important factor that promotes institutional integration, degree aspirations, and degree attainment for low-SES students. In addition, this study's findings encourage not only exploration of how students' finances influence enrollment decisions and persistence, but also how finances interact with background characteristics and institutional experiences to shape degree attainment.

**Interactionalist**

Interactionalist perspectives represent a third stage of degree attainment that encompasses students' experiences throughout their enrollment in an institution. While there is strong support for the influence of students' academic and social integration on persistence decisions, the research does not provide an understanding of how these experiences might vary by SES (Terenzini et al., 2001). This lack of attention to SES is due to its frequent use as a control variable, rather than a variable of intrinsic interest. This study's findings that
low-SES students’ academic and social integration had a direct effect on degree attainment affirms the interactionalist model (Tinto, 1975), and is consistent with previous research that indicates the degree of interaction with faculty and peers is frequently a strong predictor of student persistence (Braxton et al., 1997; Cabrera et al., 1990; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1980).

Academic integration. As explained in Chapter Two, previous research offers mixed conclusions regarding the influence of academic integration on persistence and degree attainment. Berger (2000) offered one possible explanation for the variety of findings, suggesting that academic integration is not important for all students. He implied that academic integration may be a more important precursor to degree attainment for students from disadvantaged backgrounds. This study’s finding that academic integration has an important direct effect on degree attainment for low-SES students offers support to Berger’s contention.

Another explanation for the variety of findings concerning academic integration is related to differences in multi- and single-institutional studies. In a summary of multi-institutional studies that considered the influence of academic integration on student departure, Braxton and Lien (2000) found that 15 out of 20 studies demonstrated that academic integration has a statistically significant effect on student departure. However, they found modest support for the effect of academic integration on student departure when reviewing single-institutional studies. They concluded that multi-institutional studies may benefit from variability in the measurement of academic integration across institutions and from a consistent measure of academic integration with a large sample.
Following Tinto’s (1975) theory, Braxton and Lien (2000) suggested that student departure occurs when students “experience incongruence with the beliefs and values inherent in the academic communities of an institution and/or when students feel a sense of intellectual isolation in such communities” (p. 24). The results from this study suggest that there is value in using noncognitive variables to reflect students’ behaviors related to academic integration. The four variables in this study that comprised the academic integration scale (participation in study groups, social contact with faculty, meeting with academic advisors, and talking with faculty about academic matters outside of class) may prove more valuable compared to abstract measures of academic integration. Examples of abstract measures used in previous research include students’ perceptions of academic development or the degree to which they believe they are achieving academic goals (Braxton et al., 1997; Stage & Hossler, 2000). These behavioral measures, therefore, may offer insights into students’ experiences of academic communities.

Similar to previous research, this study found that even with relevant background characteristics held constant, the extent of students’ academic integration is positively related to students’ educational aspirations (Pascarella & Terenzini, 1991). Other research indicates that academic integration has an effect on students’ commitment to earning a degree (Cabrera et al., 1992). The results from this study indicate potential value in exploring how academic integration contributes to low-SES students’ aspirations, as well as their commitment to earning a degree.

The data from the BPS: 90 longitudinal study indicated that low-SES students’ academic integration index was significantly lower than the highest SES-students (Terenzini et al., 2001). Combined with the finding that academic integration has an effect on low-SES
students' degree attainment, the tendency for low-SES students to experience low levels of academic integration indicates a need to find ways to enhance their academic experiences within institutions. Astin (1993) contended that higher-SES students are more prepared for higher education academic environments. Social reproduction theory indicates that habitus, faculty interaction, and peer interaction may shape students' academic behaviors. If low-SES students enter institutions with a habitus that limits their confidence in the academic environment, behaviors such as interaction with faculty can have an important impact. For example, Walpole (2003) found that activities such as working on a professor's research project and talking with faculty outside significantly increased the likelihood of low-SES students attending graduate school. While low-SES students may enter institutions with less "academic capital," faculty interaction can help to reduce low-SES students' feelings of intellectual isolation and to enhance their sense of belonging.

Social integration. There is ample evidence that indicates social participation enhances social integration and connection with an institution, which increases the likelihood of completing a baccalaureate degree (Bean, 1982; Tinto, 1975). Similarly, the socialization model of status attainment considered in this study suggests that interactions with significant others influence the attainment process (e.g., Sewell et al., 1969, 1970). Following the status attainment perspective, social integration may provide students with a network of other achievement-oriented peers who encourage and reinforce aspirations and goals.

Astin (1993) concluded, "the student's peer group is the single most potent source of influence on growth and development during the undergraduate years" (p. 398), and suggested that these peer group effects surpass effects of faculty, curriculum, and institutional type. Astin indicated that peer interaction facilitates students' intellectual and
personal development through affiliation. Students who do not have frequent peer
interactions are likely to interact frequently with non-student groups such as co-workers,
family members, or friends outside of the institution. The results from this study support
Astin’s conclusions regarding the influence of peer groups, finding that social integration has
a direct effect on degree attainment for low-SES students. Students’ involvement with the
fine arts, sports activities, college organizations, and social activities with peers was directly
related to degree attainment. Similarly, previous research provides support for the net effect
of peer relationships and extracurricular involvement on persistence (Tinto, 1997) and
bachelor’s degree completion (Stoecker et al., 1988). The finding that social integration has a
positive effect on degree attainment is consistent with a general status attainment model,
which emphasizes the relationship between interaction with significant others and the
attainment process.

The finding that parents’ education has a direct effect on students’ social integration
indicates that low-SES students benefit from the educational experiences of their parents.
According to Bourdieu (1977), educational experiences of parents can serve as important
sources of social and cultural capital that influence their children’s access to social networks
and beliefs. Parents with experiences in higher education can provide their children with
additional support, encouragement, and knowledge regarding the transitions related to
postsecondary education. It is clear that low-SES students benefit from these socializing
experiences that help to shape their habitus or sense of place within higher education
institutions. The findings from this study offer support for the assertion that social class
shapes students’ experiences in higher education institutions (McDonough, 1997).
Socioeconomic class may have an important influence on how students experience institutional environments and their willingness to participate in campus life. Previous research suggests that low-SES students report lower levels of involvement with other students and organizations, participation in programs, and use of recreational facilities. Terenzini et al. (2001) summarized two separate national studies, which found that low-SES students had significantly lower social integration compared to high-SES students. The tendency of low-SES students to experience low levels of social integration, coupled with this study's finding that social integration has a direct effect on degree attainment for low-SES students, indicates the need to address social integration experiences of this population. Following the social reproduction theory, students who share or have exposure to the dominant student attitudes and aspirations have the least amount of attitudinal and behavioral adjustment to become integrated on campus (Berger, 2000). Considering that students who are less congruent with their environment are less likely to be successful (Strange & Banning, 2001), it seems especially important to identify how institutional environments may discourage social integration of low-SES students and to promote exposure to the multiple student attitudes and aspirations on campus. The challenge facing institutions is to find ways to foster authentic relationships and an inclusive sense of belonging for low-SES students who may experience limited person-environment congruence.

Institutional integration. Tinto (2000) called for analysis that examines how interactions in the academic and social spheres of institutions shape educational opportunity structures and the degree attainment process. The findings from this research suggest that low-SES students' experiences in the academic and social spheres of institutions have a distinct influence on degree attainment. Academic integration and social integration represent
important aspects of students' educational experiences that help to structure or influence their educational opportunities.

While the findings of this study support the importance of academic and social integration in the degree attainment process, aside from the influence of grants and parents' education level, the results do not provide details regarding what student characteristics may help to facilitate students' academic and social integration. In particular, the finding that previous academic experiences and initial aspirations did not influence integration was surprising.

Previous research indicates that academic and social integration tend to interact in a reciprocal manner (Pascarella & Terenzini, 1991). This study considered the relationship between these aspects in an effort to understand how academic and social life are connected, rather than conceptualizing academic and social integration as distinct activities (Braxton et al., 2000; Tinto, 2000). The finding that academic integration and social integration were positively correlated indicates that rather than a reciprocal interaction, the academic and social integration perceptions of low-SES students combined to influence degree attainment.

Implications for Theory and Research

The results of this study provide evidence that elaboration of the socialization theory of degree attainment by including economic and interactional factors offers a more complex understanding of the interaction among predictors of degree attainment. The findings indicate that the understanding of degree attainment of low-SES students can be enhanced by considering the individual and collective influences of students' early academic achievement, degree aspirations, financial resources, academic integration, and social integration. A theoretical framework that merges existing knowledge about factors that influence the degree
attainment process may provide new insights into the complex interaction of these factors. In addition, this broad theoretical framework has the potential to examine how the degree attainment process might differ for various categories of students. The findings of this study have implications for ongoing efforts to refine and reconstruct student departure and degree attainment theories in higher education.

A previous National Center for Education Statistics study using BPS: 90/94 data found that parents' educational level influences a student's success in enrolling in a postsecondary education institution; however, after controlling for all other factors, SES was not significantly related to persistence and attainment (Nunez & Cuccaro-Alamin, 1998). Similarly, this study's findings that SES had relatively few effects on subsequent factors in the proposed causal model indicate the need to gain a better understanding of how sociodemographic variables and experiences connect with achieving students' educational goals. This study represents one response to Stage and Hossler's (2000) call for a comprehensive student-centered theory of persistence that combines elements of student background, school experiences, intentions, preparations, and college entry. This framework offers the promise of conceptualizing degree attainment as a continuous process rather than distinct phases such as college choice, college enrollment, and persistence. However, it is important to note that the variables in the final causal model offer limited understanding of the variance of several endogenous variables, including degree attainment ($R^2 = 0.20$).

Previous research using SEM to investigate retention and degree attainment has provided models with $R^2$ values ranging from 0.18 to 0.47 (e.g., Allen, 1999; Anderson, 1988; Cabrera et al., 1992; Pascarella & Terenzini, 1983). Although other methods such as stepwise regression and factor analysis provide advantages in accounting for the variance in dependent
variables, SEM remains useful because it requires an explicit specification of causal relationships and allows the researcher to examine indirect causal effects (Wolfle, 1985). In other words, the intent of causal models is to understand causal relationships among variables through a “statistically rigorous quantitative assessment of theoretical relationships” (Wolfle, p. 381). In this sense, the primary purpose of causal models is to examine multiple causal relationships rather than seeking to predict a single dependent variable, such as degree attainment.

Several variables not considered in this study would contribute to the understanding of degree attainment and reduce the amount of unexplained variance in the model. For example, Pascarella and Terenzini (1991) indicated college grades are the best predictor of degree attainment. In addition, previous research suggests that individual’s connection to an institution is an important factor that influences degree attainment (Cabrera et al., 1992, 1993). These variables represent important factors that may influence low-SES students’ degree attainment process and should be considered in future research. It is clear that additional research is needed to gain an understanding of how other factors influence low-SES students’ entire degree attainment process.

The results of this study support the need to expand economic models of persistence and degree attainment to consider not only the importance of individual finances and financial aid on degree attainment decisions, but to also examine the additional forces that interact with economic resources to impact degree attainment. Tinto (1986) explained that while it is clear that financial considerations are important for students from disadvantaged backgrounds, there is little evidence to support the contention that economic forces are paramount in degree attainment once students are in college. Tinto suggested the need to
expand economic models of persistence because previous research focused on the influence of finances on access (rather than persistence) and a lack of understanding of how finances related to long-term patterns of student departure. The findings of this study provide strong support for the need to consider factors from both the economic and interactionalist theories of degree attainment.

In addition, the findings have implications for ongoing efforts to assess the effects of student financial aid by expanding efforts to explore how student financial aid is interrelated with students' background characteristics, collegiate experiences, and the degree attainment process. Integrative approaches to studying persistence have examined how financial factors are related with students' collegiate experiences and re-enrollment decisions (Cabrera et al., 1992; St. John et al., 1996). This study builds upon these previous integrative models in several ways. First, this study provides support for examining how the relationship between financial factors and institutional experiences might vary by various student categories such as socioeconomic class. Previous research that controls for SES differences limits the ability to understand the unique experiences of low-SES students. Secondly, this study lends support to additional research that considers how different forms of financial aid contribute to degree attainment. Global measures of financial aid or students' ability to pay may limit a detailed understanding of how financial aid influences students' institutional experiences and indirectly influences degree attainment.

While this study empirically demonstrated that financial aid in the form of grants has an influence on students' academic and social integration, additional research may provide a grounded discussion about why this connection exists. While both the status attainment and social reproduction frameworks offer possible insights into the importance of economic
capital, future research may examine the ways that student aid shapes how students interact in their social and academic environments. In short, the results provide support for additional work using a Bourdieuan framework that shifts the focus from issues of access and equity to a focus on the ways that structures such as financial aid can shape students’ experiences. This research focus may provide insights into the ways that low-SES students convert financial aid resources into forms of capital that assist the degree attainment process.

Whereas Tinto (1987) constrained the influence of environmental factors to shaping commitments, this study indicates that environmental factors such as students’ early academic preparation and financial aid exert influence on students’ degree aspirations and students’ academic and socialization experiences within higher education institutions. These findings support Bean’s (1985) suggestion that environmental factors need to be considered when explaining the persistence process. Tinto (2000) described the educational opportunity structure as the “interconnected chains of relationships and interactions out of which personal affiliations are wrought and contextual learning arises” (p. 92). This study offers a framework to examine the multiple factors that influence the educational opportunity structure. In particular, this study suggests that it is beneficial to examine how students’ experiences of organizational environments might differ based upon background characteristics and previous experiences.

While this study did not compare effects among colleges (such as institutional quality, institutional control, and institutional size) on degree attainment, it is clear that these structural characteristics have significant effects on educational attainment by shaping students’ social and academic experiences (Anderson, 1988; Pascarella & Terenzini, 1991). In addition, Berger (2000) explained that the higher education system engages in a sorting,
choosing, and selecting process that shapes the student composition of institutions. Given
that a majority of the low-students in this study attended least selective institutions (68.6%) and public institutions with enrollments greater than 10,000 (52.2%), it is important to consider how these factors shape students’ institutional experiences and degree attainment. Furthermore, the dominant student attitudes and characteristics on college campuses have an important influence on individuals’ educational experiences (Astin, 1993; Milem, 1998). Several theories of person-environment interaction indicate the importance of student congruence with their educational environment (Strange & Banning, 2001). Future research, therefore, should consider how the factors considered in this study shape students’ experiences in various institutional settings. For example, Anderson (1988) considered how factors such as the proportion of low-income students, the mean SAT score of the entering student class, selectivity, the proportion of students who live on campus, and the percentage of undergraduates who are enrolled part time influence student involvement, academic performance, goal commitment, and degree attainment. Additional research that considers institutional characteristics could help in understanding the ways that low-SES students choose institutions and how institutional choice influences subsequent educational outcomes such as involvement, academic performance, degree aspirations, and degree attainment.

Implications for Practice

The results of this study provide several implications for higher education practice. The discussion of implications for practice examines two general areas: financial aid policy and institutional practice.
Financial Aid

In summary, the results of this study support previous research conducted by the U. S. General Accounting Office (1995), which found a 14% reduction in the dropout probability of low-SES students with an additional $1,000 in grant aid. Financial aid in the form of grants is important for low-SES students not only because it equalizes access to educational opportunities and provides essential economic support, but also because it facilitates students' integration into the academic and social spheres of the institution. The provision of adequate financial resources can compensate for low-SES students' lack of economic, social, and cultural capital. Increases in grant aid enhance economic capital by providing low-SES students with important financial resources that support their ability to earn a baccalaureate degree. This economic capital may enhance students' ability to invest energy and effort into their educational experiences rather than work experiences. Grant aid enhances low-SES students' social capital through its influence on subsequent social and academic interactions, which offer valuable networks and connections to the institution. Lastly, grant aid has an indirect influence on students' degree aspirations, indicating that it influences students' attitudes and beliefs about their ability to earn a degree. This conclusion has implications for the packaging of student aid for low-SES students.

The results of this study also inform policymakers and practitioners about both the impact of finances on low-SES students' institutional experiences and the subsequent effect on the degree attainment process. Evaluation of the effectiveness of financial aid programs for low-SES students needs to consider the multiple factors (e.g., socialization, economic, integration) that interact to influence degree attainment decisions and behaviors. Intervention
strategies and financial aid policies, therefore, should consider the holistic nature of finances in the degree attainment process.

The results of this study question recent policy trends, which demonstrate a shift away from need-based student aid programs. Federal aid policies, such as tax credits or increases in student and parent loans, provide the greatest benefit for middle-class students who would otherwise engage in postsecondary education (Wolanin, 2001). Consider that during the time period from 1990 until 1998, the real increase in guaranteed and direct loans has been 116% compared to a 20% increase in real expenditures for the Pell Grant program (College Board, 1999). McPherson and Schapiro (2002) explain that, although total federal aid during this same time period increased from $26.1 billion to $46.0 billion, most of this increase has been in loans rather than grants. The concern is that these federal aid policies displace grant awards that have been instrumental in fulfilling the policy goal of narrowing income-related gaps in postsecondary enrollment, persistence, and degree attainment. As policy makers experience increasing challenges in fulfilling a national commitment to providing access to higher education and supporting the attainment of a bachelor’s degree, attention to ways that financial aid practices structure low-SES students’ access to educational opportunities is essential.

While federal financial aid policies such as tuition tax relief and increases in student loans do not close the opportunity gap, similar issues confront state financial aid policies. Heller (2002) explained that the trend of several states to expand merit aid programs often provides financial support to middle-income students who are likely to attend college regardless of the financial aid. In effect, this policy reflects a retreat from state commitments to enable educational opportunity for low-SES students.
Gladieux (2002) argued that because Pell Grants are discretionary (non-entitlement) programs in the federal budget, they do not provide guaranteed financing from year to year. In contrast, policies such as guaranteed loans and tuition tax breaks serve as annual entitlements that are not affected by federal budget pressures. In addition to its lack of guaranteed financing, the purchasing power of Pell Grant awards has steadily decreased. The Pell maximum award as a percentage of the cost of attendance has fallen from 84 percent of public four-year costs in 1975-76 to 39 percent in 1999-2000 (Advisory Committee on Student Financial Assistance, 2001). Despite recent funding increases, enhancing the value of the Pell Grant for low-income students would require a minimum grant ranging from $7,000 to $8,000 to adjust to the cost of attendance at higher education institutions and to restore the purchasing power to its maximum constant-dollar value in the late 1970s (Gladieux).

In a report entitled *Access Denied*, The Advisory Committee on Student Financial Assistance (2001) indicated that three interrelated factors pose a future access crisis in higher education. The first factor is that the cost of higher education as a percentage of family income has increased only for low-income families. Second, a shift in policy priorities has resulted in an increase in unmet need of low-income students. Third, in response to high costs and high unmet need, low-income students often attend part-time, work long hours, and borrow heavily which combine to lower the probability of degree completion. *Access Denied* also indicated that future demographic trends threaten to further undermine access for low-income students because of projected changes in the nation’s income, expected family contribution, and unmet need distributions of college-age students that will greatly increase the amount of required financial aid. In summary, the shift in financial aid policy goals from access to middle-income affordability and merit amounts to a significant loss for low-SES
students. To address the needs of low-SES students, there is a need to restore a commitment to fostering access as a core concern of federal higher education policy and to increasing funding from the federal budget for need-based grants.

Institutional Practice

The results of this study also provide suggestions for institutional policies and programmatic efforts that would improve degree attainment for low-SES students. The discussion of institutional practice implications considers ways that institutions can address low-SES students’ needs for academic preparation, support services, and academic and social integration experiences.

Considering that students’ early academic performance is one of the strongest predictors of degree attainment, intervention strategies such as remediation may serve to assist low-SES students who begin college with a deficit in academic preparation or skills. The results of this study indicate that students’ early academic preparation has an important direct effect on low-SES students’ development of degree aspirations and degree attainment. Efforts to provide academic support to low-SES students with deficits in their academic preparation will enhance their ability to earn a bachelor’s degree. While there is an inverse relationship between students’ need for remedial courses and degree completion (Adelman, 1999; U.S. Department of Education, 2000), research shows that low-income students who require remediation need to complete only one or two remedial courses to graduate at similar rates to their peers who require no remedial coursework (Breneman & Merisotis, 2002). Institutional efforts to identify students who need remedial courses and to develop appropriate courses represent strategies that could benefit students in the degree attainment process.
College support services represent another institutional strategy that could enhance low-SES students' ability to earn a baccalaureate degree. The TRIO programs, sponsored by the U.S. Department of Education, represent an important federal initiative to support low-SES students. The three TRIO programs that provide the majority of support for college students include Educational Opportunity Centers, Student Support Services, and the McNair Postbaccalaureate Achievement programs (Breneman & Merisotis, 2002). In particular, the Student Support Services program offers low-SES students access to academic counseling, mentoring, tutoring, and remedial instruction. Previous research has indicated that through programmatic efforts such as peer tutoring, cultural events, workshops, and instructional courses for program participants, TRIO participants have higher rates of degree attainment than non-TRIO participants (Balz & Esten, 1998; U.S. Department of Education, 1997).

Considering the results of this study that indicate the importance of early academic preparation, it is clear that institutions should consider ways to expand remediation efforts and college support services programs in order to provide low-SES students with important academic support. The impact of these programs is twofold. First, the programs can help to provide students with important academic support that can affect their subsequent academic performance. Secondly, these programs may contribute to students' academic and social integration within the institution. The discussion of implications for practice next considers how institutions can influence individual's academic and social integration.

Following Tinto's (1975) interactionalist theory and Bourdieu's (1977) theory of social reproduction, the results of this study suggest that the academic and social subsystems of campuses have an important influence on students' experiences. This research provides support for other research that suggests both students' class-related experiences and their out-
of-class experiences enhance student learning (Pascarella & Terenzini, 1991; Terenzini, Springer, Pascarella, & Nora, 1995). Not only do activities such as involvement with faculty and having conversations about fine art activities contribute to the intrinsic value students attach to learning (Terenzini et al.), this research indicates that similar involvement activities also contribute to degree attainment.

It is clear that faculty interaction plays an important role in degree attainment. Regarding faculty interaction, Astin (1993) suggested that the amount of personal contact and the quality of contact with faculty are important factors that influence student learning and development. The results of Astin’s research indicated that student-faculty interaction had a positive correlation with several academic attainment measures including college GPA, degree attainment, graduating with honors, and enrollment in graduate school. The four variables used in this study to measure academic integration — participation in study groups, social contact with faculty, meeting with academic advisors, and talking with faculty about academic matters outside of class — represent important institutional strategies that can assist low-SES students’ development of degree aspirations and attainment of a baccalaureate degree. Institutions should find ways to enhance and support meaningful interactions between faculty and students such as faculty-supervised internships or faculty-moderated class discussions in an effort to improve both the quantity and quality of student-faculty interactions (Kuh & Hu, 2001). Examples of institutional practices that enhance student/faculty interaction could include limiting the use of teaching assistants, involving students in research, and encouraging student-centered practices through institutional reward systems (Kuh, Schuh, & Whitt, 1991). Research through the National Survey of Student Engagement (NSSE, 2003) further supports the importance of student interactions with
faculty. The NSSE 2003 annual report indicates that both student-faculty interactions and a supportive campus environment (institutional emphasis on providing support and quality of relationships with people at the institution) play an important part in students' personal and social development; gains in writing, speaking, and analyzing; and gains in practical knowledge and skills.

Kuh (2000) indicated that the amount of time faculty devote to students is influenced by institutional type and expectations of institutional leaders. It is clear that if institutions wish to increase the ability of faculty members to have social contact with students, meet with advisees, and talk with students about academic matters outside of class, there is a need to address other demands on faculty time such as improving instruction, engaging in scholarly inquiry, and serving on committees.

The results from this study also emphasize the important effect of social integration on degree attainment for low-SES students. The measures of social integration — attending fine arts activities, participating in intramural or non-varsity sports, participation in school clubs, and going places with friends from school — represent significant strategies that serve to connect low-SES students with the social subsystem of institutions and increase degree attainment. Institutional experiences, therefore, can serve to support low-SES students who may enter higher education with lower levels of economic, social, and cultural capital. This research supports efforts of student affairs professionals to find new ways to engage students in activities that encourage interactions with peers.

The higher education literature provides ample evidence of institutional practices that facilitate students' social integration. In a review of literature that examines the effects of students' out-of-class experiences on academic, intellectual, and cognitive learning
outcomes, Terenzini et al. (1996) provided several examples of effective practices that student affairs professionals can control through policy or programmatic interventions. They indicated that residence halls offer students opportunities to interact with peers and faculty members and may facilitate students' cognitive development. Specific residence halls that are programmatically designed to promote academic and intellectual development (i.e., living-learning centers) offer another promising practice. These learning-living centers typically offer students high levels of faculty-student interaction, intellectually-oriented programming, and supportive peer environments. Terenzini et al. also suggested that experiences such as working part-time on campus, interacting with students and faculty members on academically or intellectually related topics, and socializing with others of different racial or ethnic groups contribute to students' cognitive and intellectual development. In short, institutional efforts to encourage peer interaction may facilitate low-SES students' intellectual and personal development through affiliation.

Practitioners should heed the advice of Kuh et al. (1991), who suggested, "Institutions should be aware of who is involved, who is not, and why" (p. 316). When considering the experiences of low-SES students, practitioners could find ways to evaluate the access to opportunities for social and academic integration. For example, institutions might consider the ways that they encourage students to become involved in activities and positions of responsibility with particular attention to the possible reasons why low-SES students might not become involved. The theoretical perspectives used for this study indicate that low-SES college students' family background, cultural capital, and habitus can influence whether or not students become involved in the life of a college. Efforts to assess the involvement of low-SES students would provide institutions with clear strategies to enhance both academic
and social integration. Institutions should also consider the extent to which policies and programs both encourage active student participation in the planning, organization, and implementation of various student activities and promote student learning (Terenzini et al., 1996).

Two findings of this study provide support for developing partnerships between academic affairs and student affairs. First, the results indicated that both academic and social integration have indirect and direct effects on degree attainment. Second, the results indicated that students’ academic and social integration experiences are correlated, a finding that suggests efforts to improve one aspect of integration may have a positive influence on other integration experiences. Similar to Braxton et al. (2000), the findings from this study indicate a need to pay attention to how students’ academic and social experiences collectively affect the process of integration. Researchers have called for a seamless learning environment (Kuh, 1996) that blurs the boundaries between students’ academic and out-of-class lives (Terenzini et al., 1996). Engstrom and Tinto (2000) offered examples of recent initiatives that support collaborative learning and have the possibility of transforming institutions into learning-centered organizations. Specifically, they indicated that learning communities and service learning offer strong potential for engaging students in integrated learning experiences and for promoting collaboration between academic and student affairs. Given the importance of academic and social integration on degree attainment, institutions should consider similar initiatives that enhance collaborative learning.

Summary

The purpose of this study was to develop an integrated understanding of how social, economic, and interactional factors affect degree attainment for low-SES students. The
results of this study indicate that several factors influence low-SES students’ baccalaureate degree attainment. First, students’ early academic performance, measured by high school GPA and SAT scores, is a significant factor in the degree attainment process. The findings from this study indicate that early academic performance not only has a direct influence on degree attainment, but it also has an influence on the development of students’ degree aspirations while they are enrolled in college. Second, this study’s results support the socialization theory of degree attainment in that students’ degree aspirations have a significant effect on degree attainment. Third, the findings from this study indicate that increases in students’ grant/budget ratio are associated with increases in students’ self-reported levels of academic and social integration. Fourth, increases in student behaviors that are associated with increased levels of academic and social integration have a positive effect on degree attainment.

Completion of the bachelor’s degree represents an important educational step in the occupational and economic attainment process. The results of this study provide insights into how socialization, economic, and interactional factors individually and collectively influence low-SES students’ completion of a baccalaureate degree. Hopefully, this study will stimulate additional research, dialogue, and suggestions for practice regarding ways to influence the degree attainment process of low-SES students.
APPENDIX A

VARIABLE DEFINITIONS
<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Definition</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (SBGENDER)</td>
<td>Student gender based on student- or institution-reported gender, or gender reported on the FAFSA. Where gender not available, imputed based on student's first name. Sources: Computer assisted data entry (CADE), NPSAS:1996 Student Computer assisted telephone interview) CATI, Imputation</td>
<td>0 = Female 1 = Male</td>
</tr>
<tr>
<td>Race (SBRACE)</td>
<td>Response to CATI question: What is your race? Sources: CADE, NPSAS:1996 Student CATI, BPS:1998 CATI, ETS, ACT</td>
<td>0 = not white 1 = white</td>
</tr>
<tr>
<td>Parents' Education (PBEDHI3)</td>
<td>Aggregated educational level of parent with greater educational attainment, as reported by the parent respondent, or the student, if no parent CATI was obtained. Reflects editing of father's or mother's education based on father's or mother's occupation, where occupational and educational levels were discrepant. Sources: NPSAS:1996 Parent or Student CATI, BPS:1998 CATI, ETS, ACT</td>
<td>1 = High school diploma or less 2 = Some postsecondary education 3 = Bachelor's degree 4 = Postbaccalaureate degree</td>
</tr>
<tr>
<td>High school grade point average (HCGPAREP)</td>
<td>High school grade point average on the standardized test date, according to self-report on test questionnaire. For a number of students, both ETS and ACT score reports were available. In these cases, high school grade and curriculum information from the more recent test date was used. Applies to: Students who took the SAT or ACT. Sources: ETS, ACT</td>
<td>1 = D- to D 2 = D to C- 3 = C- to C 4 = C to B- 5 = B- to B 6 = B to A- 7 = A- to A</td>
</tr>
<tr>
<td>Variable Name</td>
<td>Definition</td>
<td>Scale</td>
</tr>
<tr>
<td>---------------</td>
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<td>-------</td>
</tr>
<tr>
<td>SAT combined score (TESATDER)</td>
<td>SAT combined score, derived as either the sum of SAT verbal and math scores or the ACT composite score converted to an estimated SAT combined score using a concordance table from the following sources: G. Marco, A. Abdel-fattah, and P. Baron, Methods Used to Establish Score Comparability on the Enhanced ACT Assessment and the SAT (College Board Report No. 92-3) (New York: College Entrance Examination Board, 1992). Constructed from agency-reported, institution-reported, or student-reported SAT or ACT scores in the following order of precedence (with corresponding %ages of undergraduate NPSAS:1996 cases): 1) Agency-reported (ETS) SAT verbal and math scores (25%); 2) Agency-reported (ACT) ACT composite scores (19%); 3) Institution-reported (CADE) SAT verbal and math scores (7%); 4) Institution-reported (CADE) ACT composite scores (2%); 5) Student-reported (CATI) SAT verbal and math scores (&lt;1%); 6) Student-reported (CATI) ACT composite scores (&lt;1%). All SAT scores are provided in original (not re-centered) scale. Applies to: Respondents with any reported ACT composite score or SAT verbal and math scores (53% of undergraduate NPSAS:1996 cases). Sources: ETS, ACT, CADE, Student CATI</td>
<td>Continuous</td>
</tr>
<tr>
<td>Total Grant 1995-1996 (TOTGRT)</td>
<td>Indicates the total amount of all grants and scholarships: federal, state, institutional, and other received during 1995-96. Equal to sum of all federal grants (TFEDGRT), state grants (STGTAMT), institutional grants (INGTAMT), and &quot;other&quot; grants that were not classified as federal, state or institutional (OTHGTAMT). Includes employer tuition reimbursements (EMPLYAMT). Totgrt = sum(of tfedgrt, stgtamt, ingtamt, and othgtamt). Sources: NPSAS:1996, CADE, Pell file</td>
<td>Continuous</td>
</tr>
<tr>
<td>Variable Name</td>
<td>Definition</td>
<td>Scale</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Total Loan 1995-1996 (TOTLOAN)</td>
<td>Indicates the total amount of all loans: federal, state, institutional, and private sector received during 1995-96. Equal to the sum of federal loan amount (TFEDLN), state loan amount (STLNAMT), institution loan amount (INLNAMT), and other loan amount (OTHLNAMT). Does not include PLUS loans (PLUSAMT3), although TOTLOAN2 does. Totloan = sum(of tfedln, stlnamt, inlnamt, and othlnamt). Sources: NPSAS:1996, CADE, NSLDS</td>
<td>Continuous</td>
</tr>
<tr>
<td>Total Work Study 1995-96 (TFEDWRK)</td>
<td>Indicates the total amount of federal work study (FWSP) received during 1995-96. Related variables: TFEDWRK is one component of TFEDAID (total federal aid), along with TFEDLN (federal loan amount), TFEDGRT (federal grant amount), and TFEDOTHR (other federal amount). TFEDWRK is also a component of TOTWKST (total of all work-study), along with STWKAMT (state work-study amount), INSTWRK (institutional work-study amount), and OTHRWKAMT (other work-study amount). Sources: NPSAS:1996, CADE</td>
<td>Continuous</td>
</tr>
<tr>
<td>Student Budget 1995-1996 (BUDGETAJ)</td>
<td>Indicates total student budget (attendance adjusted) at the NPSAS School. BUDGETAJ estimates actual cost based on tuition paid, number of months enrolled, and attendance status while enrolled. Non-tuition costs (SBNONTUN) are reduced for half-time (75%), unknown status (50%), and less than half-time (25%) and the actual tuition (TUITION) is added to the estimated non-tuition costs. Applies only to the months attended at the NPSAS institution if more than one institution was attended (AIDSECT=10). Sources: NPSAS:1996, CADE, Pell file, Imputation</td>
<td>Continuous</td>
</tr>
<tr>
<td>Variable Name</td>
<td>Definition</td>
<td>Scale</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Degree Aspirations 1996 (EPHDEGY1) | Highest degree student ever expects to earn, asked in 1996. Response to CATI question: What is the highest level of education you ever expect to complete? | 0 = Don’t know
1 = Less than 4 years, no degree or certificate
2 = Certificate
3 = Associate’s degree
4 = Bachelor’s degree
5 = Completion of postbaccalaureate program
6 = Master’s degree
7 = Advanced degree, doctoral or first professional |

Academic Integration (ACADINT) | This variable indexes the overall level of academic integration the respondent experienced at the NPSAS institution during the 1995-96 academic year. It is derived based on the average of the responses indicating how often they had done the following items: participated in study groups (CMSTUDGP), had social contact with faculty (CMSOCIAL), met with an academic advisor (CMMEET), or talked with faculty about academic matters outside of class (CMTALK). Non-missing values for these items were averaged and the average multiplied by 100. ACADINT=(mean(CMSTUDGP,CMSOCIAL,CMMEET,CMTALK))*100. | Continuous The scale for individual items in the index is as follows:
1 = Never
2 = Sometimes
3 = Often |
<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Definition</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Integration</td>
<td>This variable indexes the overall level of social integration the respondent experienced at the NPSAS institution during the 1995-96 academic year. It is derived based on the average of the responses indicating how often they had done the following items: attended fine arts activities (CMARTS), participated in intramural or nonvarsity sports (CMINTRAM), participated in varsity or intercollegiate sports (CMVARSTY), participated in school clubs (CMCLUBS), or gone places with friends from school (CMFRIEND). Non-missing values for these items were averaged and the average multiplied by 100. ( \text{SOCINT} = (\text{mean(CMARTS, CMINTRAM, CMVARSTY, CMCLUBS, CMFRIEND)}) \times 100. ) Sources: Derived</td>
<td>Continuous</td>
</tr>
<tr>
<td>Degree Aspirations</td>
<td>Highest level of education the student expects to complete, asked in 1998. Response to CATI question: What is the highest level of education you ever expect to complete? Sources: BPS:1998 CATI</td>
<td></td>
</tr>
<tr>
<td>(EPHDEGB1)</td>
<td></td>
<td>0 = Don't know</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Less than 4 years, no degree or certificate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 = Certificate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 = Associate's degree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 = Bachelor's degree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 = Completion of postbaccalaureate program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 = Master's degree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 = Advanced degree, doctoral or first professional</td>
</tr>
<tr>
<td>(DGREBA2B)</td>
<td></td>
<td>1 = One bachelor's degree</td>
</tr>
</tbody>
</table>
APPENDIX B

CORRELATIONS AMONG ENDOGENOUS VARIABLES
|                | H.S. GPA | SAT  | Grant/ Loan/ Work-study/ Degree Degree Academic Social Degree Degree Gender Ethnicity Parent Parent |
|----------------|----------|------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| H. S. GPA      | 1.00     |      |             |             |                 |                  |                       |                      |                      |                      |
| SAT            | 0.36     | 1.00 |            |             |                 |                  |                       |                      |                      |                      |
| Grant ratio    | 0.20     | 0.20 | 1.00       |             |                 |                  |                       |                      |                      |                      |
| Loan ratio     | -0.01    | 0.00 | -0.12      | 1.00       |                 |                  |                       |                      |                      |                      |
| Work-study ratio | 0.00   | -0.01 | 0.16 | 0.00 | 1.00 |                       |                      |                      |                      |                      |
| Aspiration (1996) | 0.03 | 0.02 | 0.03 | 0.00 | 0.00 | 1.00 |                       |                      |                      |                      |
| Academic integration | 0.03 | 0.03 | 0.13 | -0.02 | 0.02 | 0.08 | 1.00 |                       |                      |                      |                      |
| Social integration | 0.05 | 0.10 | 0.20 | -0.04 | 0.03 | -0.02 | 0.32 | 1.00 |                       |                      |                      |
| Aspiration (1998) | 0.18 | 0.23 | 0.08 | 0.00 | 0.00 | 0.31 | 0.16 | 0.06 | 1.00 |                       |
| Degree         | 0.33     | 0.24 | 0.12      | -0.01      | 0.01  | 0.07  | 0.14  | 0.16  | 0.26  | 1.00 |
| Gender         | 0.00     | 0.16 | -0.02     | 0.00      | -0.01 | 0.00  | 0.00  | 0.01  | 0.03  | -0.11 | 1.00 |
| Ethnicity      | 0.00     | 0.36 | -0.05     | -0.01     | -0.02 | -0.16 | -0.02 | 0.16  | 0.02  | 0.05  | 0.09  | 1.00 |
| Parent education | 0.08 | 0.02 | 0.08     | -0.11     | 0.03  | -0.01 | 0.17  | 0.01  | 0.04  | 0.00  | 0.06  | 1.00 |
| Parent income  | -0.02    | 0.06 | -0.37     | -0.02     | -0.13 | -0.02 | -0.05 | -0.08 | 0.00  | -0.02 | 0.06  | 0.15 | -0.22 | 1.00 |
APPENDIX C.

ADDITIONAL GOODNESS-OF-FIT STATISTICS
<table>
<thead>
<tr>
<th>Index Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-centrality parameter (NCP)</td>
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<tr>
<td>Minimum fit function value</td>
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<tr>
<td>Population discrepancy function value (FO)</td>
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<tr>
<td>Expected cross-validation index (ECVI)</td>
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</tr>
<tr>
<td>ECVI for saturated model</td>
<td>0.49</td>
</tr>
<tr>
<td>ECVI for independence model</td>
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</tr>
<tr>
<td>Independence AIC</td>
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<tr>
<td>Model AIC</td>
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<tr>
<td>Saturated AIC</td>
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<td>Independence CAIC</td>
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<tr>
<td>Model CAIC</td>
<td>491.50</td>
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<td>Saturated CAIC</td>
<td>743.39</td>
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<tr>
<td>Non-normed fit index (NNFI)</td>
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<tr>
<td>Parsimony normed fit index (PNFI)</td>
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<tr>
<td>Incremental fit index (IFI)</td>
<td>0.98</td>
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<tr>
<td>Relative fit index (RFI)</td>
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<tr>
<td>Parsimony goodness of fit index (PGFI)</td>
<td>0.56</td>
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</tbody>
</table>
REFERENCES


