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# The ecology of effective academic functioning of Puerto Rican college students.

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THE ECOLOGY OF EFFECTIVE ACADEMIC FUNCTIONING  
OF PUERTO RICAN COLLEGE STUDENTS

A Dissertation Presented

by

Luis H. Colon

Submitted to the Graduate School of the  
University of Massachusetts in partial fulfillment  
of the requirements for the degree of

DOCTOR OF EDUCATION

September 1980

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Luis H. Colon

1980

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ABSTRACT

The Ecology of Effective Academic Functioning  
of Puerto Rican College Students

August 1980

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This is a study of the relationship between effective academic functioning and ecosystemic factors among a Puerto Rican college student sample, using the conceptual frameworks of ecological and systems theory. Subjects were selected from the Puerto Rican undergraduate student population at the University of Massachusetts at Amherst.

An alternative paradigm for the study of academic functioning was developed and is contained in what was denominated as the Ecological Model of Academic Functioning (the EcoModel). Methodologically, the EcoModel allowed for the inclusion of 346 variables to be studied simultaneously, yet retained conceptual cohesiveness. The 346 influential variables were grouped into seventeen clusters of independent effects for systematic empirical scrutiny.

To determine the main clusters of effects within the various measures in the study that were internally heterogenous in terms of their item composition and structure, factor analyses were computed in a way that was consistent with the levels of the EcoModel.

To test the value contributed by each of the clusters of

variables to the variance in academic functioning, stepwise multiple regression solutions were computed for each level of the EcoModel. As a first step, multiple regression analyses were computed separately for the personal and systemic levels of the model. The second step was to compute a multiple regression solution that combined all the variables from the personal and systemic levels in a stepwise regression hierarchy.

Only the variables of Agency Support, Immediate Family Support, and Self-Esteem showed statistically significant probability values at the .05 level. Among the major findings it was observed that on-campus agencies and the students' immediate family networks were more predictive of effective academic functioning than were the personal variables.

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## C H A P T E R I

### INTRODUCTION

The ecology of effective academic functioning may be defined as the study of the complex transactions between students and their surrounding environmental systems, to cope with demands to achieve successfully in their academic pursuits. This chapter is organized around the following objectives:

1. to establish the problem that led to this research study
2. to discuss the approach and purpose of the study
3. to describe the organization of the dissertation, and
4. to comment on the significance of the study

Adaptation to college is a difficult process for many Puerto Rican students in the United States. Many of these students experience a great deal of "isolation, assimilation, and identity problems" (Jackson and Depuydt, 1974) in addition to the stresses involved in coping with their social and academic demands. A large number of Puerto Rican students withdraw from the academic system thinking that they are unable to succeed in college.

On the other hand there is a number of these students who successfully achieve in their academic pursuits. What makes this possible? What are the factors that contribute to academic success among Puerto Ricans in the United States?

At a time when agencies at all levels are funneling considerable resources into human services and education for minority groups, we need to ask these and many other questions. We need to formulate an empirical basis for efficient allocation and utilization of such human and material resources, so that they truly promote the social and academic development of minority students.

#### An Elaboration of Approach

Traditionally, academic functioning has been tied to the process of calculating and reporting grades for each student in order to classify their particular level of achievement and classroom behavior exhibited. Consequently, it has been traditionally believed that the functioning and level of achievement of each student depends on the student and the student alone. This tradition is in part a function of the gap in scientific knowledge about the environments in which students function and about the processes of interaction between the students and their environments. Existing concepts tend to focus primarily

on the individual student (e.g.: grades, exams, scores, I.Q., honors) to the exclusion of other factors, some of which appear to have a substantial and enduring effect on academic functioning (e.g.: classroom settings, student support networks, primary language of instruction).

However, our ability to understand the ecology of academic functioning is increasing with the emerging theoretical frameworks being developed by ecologically oriented researchers and practitioners. Most notable among the changes proposed by these researchers is a shift from the endogenous models of behavior which assume that academic functioning can be explained by looking at the variables within the student. The new trend is toward a more ecologically sensitive model. What becomes critical is knowing how the student interlinks with the various systems of the immediate ecological surround to cope effectively with academic demands.

As a matter of definition, the term ecology is differentiated from environment in two major ways: first, the term environment is usually used to designate those portions of the total physical and symbolic worlds situated outside of and surrounding the person. Secondly, ecology does not focus on either the person or its environment, but rather on the interaction between both. Furthermore, such interaction is defined as a coping process through which human beings adapt to the environment.

The ecology of human functioning is best described as a highly complex and dynamic process of reciprocal interaction and accommodation between personal and environmental systems. As Bronfenbrenner (1977) argues, understanding human functioning demands going beyond the individual on to "multiperson systems of interaction not limited to a single setting and must take into



account aspects of the environment beyond the immediate situation containing the subject".

This principle is applicable to the study of effective academic functioning, and points to the fact that students operate within the context of broader social and environmental systems which affect them in many ways. It asserts that students are only partially responsible for their overall level of academic functioning. It further points to the importance of looking at the elements in the environment also as important contributors to student functioning with the potential of actually hindering or promoting its effectiveness.

#### An Elaboration of Purpose

Consistent with the approach outlined above, this study investigated the problem of academic functioning utilizing the conceptual frameworks of ecological and systems theories. Thus, academic functioning is conceptualized as involving a person, within a social and physical environment, in the process of achieving certain academic goals and objectives.

Specifically, our interest is to assess the relationship between effective academic functioning and ecological factors among a Puerto Rican college sample. A great deal of effort was dedicated in this study to the formulation of an alternative paradigm for the study of student functioning among this sample, compatible with the environmental and cultural realities of this group.

The resulting alternative model is contained in what has been denominated as the Ecological Model of Academic Functioning (the EcoModel), which is grounded on the pioneer work of Lewin, (1935, 1951), Barker (1968), Brimm (1975), Bronfenbrenner (1975, 1977, 1979), Moos and Insel (1976), Nuttall, Nuttall, and Pedalino (1978),

and Todd (1978) among others discussed elsewhere in this study. The model is useful in answering the following three questions:

1. what personal factors contribute to effective academic functioning?
2. what social systems support it?
3. what coping strategies sustain it?

#### Organization of the Dissertation

The EcoModel is organized around a number of ecological principles which are discussed in detail in Chapter II, as these flow from the theoretical frameworks provided by earlier researchers. Methodologically, the EcoModel allows for the inclusion of a large number of variables to be studied simultaneously, yet retains conceptual cohesiveness. The comprehensive coverage of primary ecological effects makes this an appropriate model for analyzing the complex issues of academic functioning and student coping.

Among the many possible influential variables, seventeen (17) were selected for systematic scrutiny which are discussed in Chapter III, as part of the description of the research methodology employed in this study. Subjects were selected from the total Puerto Rican undergraduate student population at the University of Massachusetts at Amherst.

The analyses of the research data are included in Chapter IV where the major findings that emerged from the statistical manipulation of the data are described.

Chapter V contains a discussion of the conclusions arising from the salient findings in the study. A section with specific

recommendations for public policy and research methodology has also been included in Chapter V.

The specific instruments employed in this study are contained in the Appendix, where each measure is discussed in detail. These instruments were prepared to correspond with the various levels of the EcoModel.

### A Final Comment on Significance

This study has significance in several areas:

#### 1. Public Policy

##### 1.1 Admissions Criteria

Findings from this study have significant value in regards to admissions criteria currently employed by colleges and universities. We have confirmed that traditional admissions criteria do not take into account variables which are important to the effective functioning of students.

##### 1.2 Organizational Change

Such findings provide a basis for systematic organizational change, since agencies, like people, lack the knowledge about the values and resources which contribute to effective academic behavior.

##### 1.3 Human Services

Knowing what factors are important to the academic functioning of students will help develop preventive and corrective intervention programs to deal with those students and organizations who lack them. In addition, such knowledge provides specific information for the design of counseling and psychoeducational approaches to serve minority student populations.

In addition to facilitating helping interventions, the present study describes the underlying methodology inherent

in the work of researchers and other professionals who approach the study of human functioning in an ecological and systemic way. In this fashion, such methodology becomes a powerful tool for ecological research and clinical "ecodiagnostic" assessment.

## 2. Research Methodology

### 2.1 Conceptual Model

Methodologically, the EcoModel not only allows for the comprehensive coverage of primary ecological effects, but represents a radical shift in paradigm, from the traditional models that hold the individual student solely responsible for his or her level of academic functioning.

### 2.2 The Sample

This study generated data on Puerto Rican college students, who comprise a sizeable portion of the United States population, and who encounter numerous problems of adaptation to the academic system. These findings may be generalized to other Puerto Rican students in public universities in the northeastern part of the United States.

## C H A P T E R I I

### REVIEW OF THE LITERATURE

Ecology is the study of the balance that exists between living organisms and their environments. This study looks at that balance as it occurs between the developing student and the changing social and academic surround. This chapter is organized around the following general objectives:

1. to describe the historical and theoretical development of the ecological approach in the social sciences and in education
2. to outline the major principles in the literature and terms toward an ecological epistemology of academic functioning
3. and to describe the ecological model that was developed for this study

## HISTORICAL ANALYSIS OF HUMAN FUNCTIONING

People of all times have been concerned with the nature of their behavior as rational, human beings. Different ideas and patterns of behavior have prevailed at different times in history because they have been supported by the institutional and social contexts in which they emerged. These ideas and patterns of behavior have led to different explanations and conceptualizations of human functioning. Explanations may be categorized in two major historical periods: pre-scientific and scientific. Almost invariably explanations have dealt primarily with the negative or deviant aspects of human behavior.

### Pre-Scientific Conceptions

Conceptions about human functioning during the pre-scientific period of modern civilization have ranged from associations of human functioning with supernatural forces, fate, destiny, magic, witchcraft, heresy, and demonic possession, to later conceptions of lunacy, insanity and madness.

### Scientific Conceptions

Since the nineteenth century, scientific conceptions about human functioning have deeply influenced our social practices, institutions, values, and beliefs. Different theories and approaches have emerged during the last hundred years, all attempting to discover the basic regulatory mechanism of human behavior. These conceptions may be grouped in three general categories:

### 1. Endogenic Conceptions

The core assumption of endogenic conceptions is that the determinants of human behavior lie within the individual. This group of conceptions pose human behavior as controlled by a variety of motives, drives, needs, instincts, or other internal attribute or characteristic.

Endogenic or internalist conceptions flourished in a period during which a strong biological orientation to human functioning prevailed. Darwin's theory of the species and early medical, psychiatric, and psychological models of behavior (Griesinger, 1845; Breuer, 1895; Kraepelin, 1898; Bleuler, 1911, Freud, 1900, 1901) initiated powerful trends which continue to operate in the newer fields of community psychology and mental health (Jahoda, 1958; White, 1959, 1973; Smith, 1959). From the beginning, the fields of medical, psychiatric, and psychological practice, which so greatly have influenced the field of education, have tenaciously persisted in maintaining an endogenic orientation to human functioning. The tradition of thinking in terms of disease and illness, of insanity, pathology, and treatment has been ingrained in common culture for more than two centuries.

The endogenous conceptions include more than the purely biological and intrapsychic models of behavior: Freudians and neo-Freudians, Rogerians, humanists, gestaltists, cognitivists, all address the inner person.

The psychodynamic formulations of first-force psychology describe strong intrapsychic pressures which determine the individual's behavior, and which the person may or may not be aware of. Likewise, humanistic formulations or third-force psychology deal with endogenous pressures of existence such as personal goals and self-actualization motives.

## 2. Exogenic Conceptions

As scientists placed increased interest on the environment more knowledge was accumulated about its effects on human functioning. As a result, behavior is no longer solely attributed to internal factors.

Exogenic or externalist conceptions are based on the core assumption that the determinants of human behavior lie outside the individual. These conceptions see behavior as controlled from without the person by some variety of pressing stimuli, conditions, and reinforcement contingencies.

The behavioral formulations of second-force psychology pose exogenic pressures which condition and determine behavior. Early and present proponents of this school are powerful and their orientation has caused significant changes in mainstream American psychology (Pavlov, 1927; Watson, 1920; Skinner, 1938, 1953).

Individuals interact with different aspects of the environment which may be categorized in terms of groups of effects which include: effects from the physical, and built environment (e.g.: climate, architecture); social and interpersonal pressures which are inherent in our mode of societal organization (e.g.: family stresses or support); and cultural pressures such as tradition, beliefs, cultural and ethnic values and norms, and behavioral prescriptions.

## 3. Ecogenic Conceptions

Ecogenic or transactional conceptions have gradually developed with input from diverse disciplines. Yet, the principles that define the ecogenic perspective of human behavior appear to have consistency and applicability across disciplines. This group of



conceptions hold that behavior is determined both from within and without the person, through a complex process of ecological adaptation. The core assumption of ecogenic conceptions is that behavior happens in the context of environmental systems which influence the person and are influenced by the person. Thus, the focus of ecogenic conceptions is on the relationship or interaction between multiple personal variables and multiple environmental variables.

Ecogenic conceptions offer a different perspective about the determinants of behavior. Collectively, these conceptions represent an ecological approach to human functioning, which is discussed next with reference to the major sources in the scientific ecological literature.

#### THEORETICAL DEVELOPMENT OF THE ECOLOGICAL APPROACH

A major difficulty in the integration of the following references into a unified ecological theory has been the broad range of research strategies applied, and the multiple variations in focus and epistemological framework among the theoretical works of the last few decades. The theoretical development of the ecological approach in the social and behavioral sciences probably started around the time Cooley (1902) was making us aware of the broad social considerations necessary in any analysis of human behavior. Lewin, by 1935 and later in 1951, introduced the concept of "psychological ecology" in reference to the effects of the ecological surround on human functioning. Since then, the ecological approach has become rapidly integrated into the methodologies of the behavioral sciences and education. The following references are among the major contributions to the ecological approach.

Social Systems Theory. This group of theories has provided a conceptual framework which defines social units larger than the individual, which operate together via social organization and which may support or hinder individual functioning. The systems way of thinking has prevailed since the 1950's (Bertalanffy, 1950; Berrien, 1968; Emery, 1969; Keeney, 1979; Miller, 1971; Moos, 1973, 1974; Murray, 1959). These writers assert that interpersonal relationships are the basis of any social system, and also that personality is itself a system that interacts with surrounding systems (Angyal, 1941; Egan and Cowan, 1977; Erickson, 1964; Goffman, 1959; Lewin, 1936; Mischel, 1974, 1977; Sundberg, 1977). Life is an arrangement of interrelated systems (e.g.: personal, societal) each person operating as an individual system in constant interaction with many surrounding systems.

The terminology of the "macrotheory", originally developed by Orville Brimm (1975) is useful as it conceives the social environment as a nested arrangement of systemic structures, each contained within the next. Structures extend outward from the personal level to the extended social, cultural, and physical levels of the environment, as follows:

a. microsystem: this level of the ecology includes the immediate family of the student, and other people who live together in the household.

b. mesosystem: this level is composed of the extended family and friends, neighbors, roommates and others who come in relevant contact with the person.

c. exosystem: this level includes the various agencies and organizations that serve the person.

d. macrosystem: included here are the values and goals of the person which are culturally learned and shared.

Brimm's schematization of the social environment is useful in conceptualizing the systems that surround students.

Social Network Analysis. This type of social analysis which developed in the 1950's as a tool in anthropology, was rapidly applied in other sociological and behavioral sciences. The social network model is used to describe and quantify an individual's family and all those with whom he or she has significant contact (Tolsdorf, 1979). Most definitions of network specify a set of linkages among a defined set of persons, in such a way that the nature of these linkages as a whole may be used to interpret the behaviors of the persons involved (Bott, 1971; Mitchell, 1969).

Tolsdorf (1979) defines "network orientation" as an individual's attitude toward networks. If in the process of socialization, the individual perceives them as supportive, receptive, empathic, and understanding, then he is likely to adopt a positive network orientation. This in turn will affect his functional relationship(s) with networks. If the individual perceives them as cold, rejecting, domineering, and controlling, then he or she will probably adopt a negative network orientation. An individual's perceptions of his network are related to coping ability and to choice of coping style.

Community Network Intervention. This approach is guided by a systematic view of families, networks, institutions, and other social systems. This type of community intervention is considered part of the network therapies (Attneave, 1969, 1975, 1976; Attneave and Speck, 1973; Gatti and Colman, 1976; Trimble, 1980).

Social Networks, Support, and Coping with Stress. The helping effect of social networks is a function of the support or lack of it available to the person at each level of the social system. Support seems to happen naturally through everyday, common social interaction. It is a natural process in networks that are functioning optimally. Thus, an effective coping strategy is that

which focuses on the natural support systems of the person (Hirsch, 1977,1978; Collins and Pancoast, 1976; Caplan and Killilea, 1976).

The concept of stress has also been used throughout the ecological literature. A great deal of effort has been put into educating the public about its possible causes and strategies for its control. We know that lower stress levels are conducive to higher levels of health (Hinckel, 1973). Stress is defined as an interaction with elements in the environment which influences the state of well being of the individual. It may be further described through interaction of the person with the environment.

Stress is a normal, necessary part of life, and offers opportunities for growth and personal development. On the other hand, if stress is not adequately dealt with, it can cause fatigue, irritability, sadness, as well as physical and mental breakdown. Such physiological and psychological symptoms emerge from conflicting and frustrating or threatening situations.

Understanding the dynamics of stress accumulation and stress reduction can help people to cope with stress more positively. This understanding is considered itself to be a skill, which may subsequently be generalized and applied in many situations.

Nuttall, Nuttall, and Pedalino in their 1978 exploratory study of the ecology of family functioning under a variety of stresses, among low income groups, used the social support theory of human interaction. They developed two types of coping strategy models, one for the short term or current situation, and one for the long term. The short term type of coping strategy is outlined next. This model has been subsequently modified and adapted in the present study to suit the specific demands of studying academic functioning and is described later in detail, in our discussion

of the EcoModel of Academic Functioning.

### Major Coping Strategies

- Strategy 1. Uses personal resources primarily
- Strategy 2. Uses immediate family resources primarily
- Strategy 3. Uses extended family resources primarily
- Strategy 4. Uses friends resources primarily
- Strategy 5. Heavy reliance on agencies
- Strategy 6. Heavy reliance on values and culture

Ecological Psychology. Ecological psychology has grown from the pioneering work of Roger Barker (1965, 1968) and Herbert Wright (1967; Barker and Wright, 1955) to a recognized branch of psychology. Barker has defined a behavior setting as a standing pattern of behavior that has a definite time and space, but does not depend on specific persons. The behaviors persist even when persons change (e.g.: classroom settings). Barker and Gump (1964) emphasized the importance of studying "behavioral rules" in natural settings, as opposed to focusing on a description of individuals and their perceptions.

A broader approach to research in human development is proposed by Urie Bronfenbrenner (1977) who outlined nine propositions toward an experimental ecology of human behavior. These propositions are extremely useful in formulating research that is ecological in orientation and perspective, and also have applicability in terms of counseling and clinical interventions. Such propositions are summarized next:

1. reciprocity. The importance of allowing for the study of reciprocal processes between persons, and between persons and their environments.

2. totality or inclusiveness. The importance of recognizing

the total social-systemic surround actually operative in any situation.

3. systems. The importance of recognizing the existence in the setting of systems that include more than two persons.

4. physical effects. Taking into account aspects of the physical environment as possible indirect influences on social and personal processes.

5. interaction. Consideration of the joint impact of two or more settings or their elements.

6. Sub-systems. Taking into account the possible subsystems and associated effects that exist across settings.

7. transition. Ecological transitions are changes in role and setting as a function of maturation or of events in the life cycle of others. Such changes are in the ecological system rather than solely within the individual.

8. contextualism. Going beyond the immediate setting containing the person to examine the larger contexts: formal and informal, that influence the immediate setting.

9. restructuring. The innovative radical transformation of prevailing ecological systems, to produce a new configuration that activates previously unrealized potentials for behavior (e.g.: redefining goals, roles, activities, or perceptions) and to interconnect systems previously isolated from each other.

Bronfenbrenner further states that the aim of his foregoing proposals is to "stimulate new, ecological directions of thought and activity ..." (p.529). The application of these principles in clinical, counseling, and psychoeducational interventions is a valuable contribution to the methodologies of the helping professions and education. Each principle cited above poses not only possibilities for direct application in the clinic and classroom, but also a radically different theoretical perspective about the processes of human living.

Ecological Systems: Assessment and Intervention. The emphasis on secondary relationships and on networks of relationships among systems and people is evident in the work of Auersweld (1968, 1971) who described the technique of the "intersystems conference". This technique is an ecological intervention intended to identify the contradictory and harmful interactions in primary and secondary relationships.

Newbrough, Simonsen, and Abril presented a workshop on ecological assessment at the National Association of School Psychologists in New York City in March of 1978. In it they outlined four basic assumptions and six important steps in the process of ecological assessment. In addition, they presented six principles of ecological research which are listed elsewhere in this chapter. They specified three alternatives to the resolution of problems:

1. changing the person who is believed to have the problem
2. or, changing the people who perceive the existence of the problem.
3. or, changing the situation.

In ecological interventions, the emphasis is on using all approaches, beginning with a focus on the situation. A given problem belongs to all the people whom it affects, rather than to a single identified person. Since problems belong to a system, and only partially to the individual, the goal is not to change the individual, but to make the system function in a way that enhances the development and well-being of all its members. The goal is a system that functions well, using its own resources and energies. Thus all those that are involved make a change, they accommodate, as does the individual initially believed to have the problem.

The Student and the Ecosystem. Todd (1979) has investigated student well-being in a University setting as it is affected by networks of people and roles, settings and policies. His research suggests that academic functioning is affected by many

more variables than student performance alone.

Bauer (1976) studied three different groups of individuals at the University of Missouri, using Pervin's Transactional Analysis of Personality and Environment, to measure the degree of person environment fit. Academic performance was found to be significantly correlated with person-environment congruency. In a similar study, Hayes (1973) conducted an appraisal of environmental press and psychological need as related to the academic success of 131 minority students at the University of Detroit. Results suggest that students with greater orientation toward non-intellectual environmental factors show less successful academic functioning than students with greater orientation toward intellectual environmental factors.

A study by Samuel Mezman (1975) investigated differences in environmental press perceptions and personality needs between disadvantaged students and majority students at the freshman and senior academic levels. Disadvantaged freshmen expected a highly protective culture when compared to dominant freshmen, whereas no difference was found between senior samples. This study suggests that minority (disadvantaged) students need greater social support individually and as a group, in order to succeed academically.

Results from a study of 397 minority students by Somogyi (1974) indicate that it is not likely that single personality factors can be used to sort students into dichotomous academic success and non-success groups. On the other hand it appears feasible to utilize demographic factors to predict academic success.

Two other studies examined the effects of financial assistance and counseling services on the educational progress of one hundred all-minority students in an urban university (Parker, 1975) and of a group counseling program on the perceived levels of



self-concept and locus of control orientation of pre-college disadvantaged students (Patton, 1975). Parker found that recipients of financial assistance and counseling demonstrated higher grade-point averages than non-recipients and graduated at higher rates. Patton found that disadvantaged students receiving counseling showed higher levels of self-concept than those who did not receive any counseling. He further stated that there was no evidence from this study to support the position that disadvantaged minority group members are external in their locus of control orientation.

Most of these researchers have reported statistically significant differences between the academic progress of minority and majority students, as a result of environmental factors. In these studies, the principal factors hypothesized to relate to academic success have been: demographic and psychological characteristics, environmental press, person-environment congruency, financial assistance, and counseling services. In this regard the present study appraises the relationship between many of these factors, and carries it further by assessing the kinds of coping strategies that lead to effective academic functioning.

Previous studies investigating the academic functioning of minority college students have not advanced hypotheses concerning stress, coping strategies, and student support networks. Families with strong support networks have been demonstrated to exhibit more effective functioning in the presence of ecosystemic stress. This relationship would appear to hold for individuals as well as families.

This review of the literature illustrates how previous studies have operated in their inquiry of academic functioning among minority college students. Most studies have focused on variables from either personal or environmental levels, or both. However, they do not follow an ecosystemic approach.

In general, the previous studies lack insight into the nature of student interaction with the ecosystem, and do not determine when and how students cope with ecosystemic stresses. In addition, their conceptualization of the environment is limited to linear causal variables (environmental press, financial assistance, counseling) . As such they fail to view academic functioning as a complex problem of ecology. In this regard, the present study appraises the relationship between many of these factors, and carries it further by assessing the nature and extent of academic stress, and the kinds of coping strategies that lead to effective academic functioning.

#### TERMS AND CONCEPTS TOWARD AN ECOLOGICAL EPISTEMOLOGY

The following concepts are organized to provide a foundation for an ecological epistemology for the analysis of human functioning in context. Our assessment of academic functioning is largely based on this scheme.

##### ECOLOGY TERMS

1. The ecology of human functioning is a highly complex and dynamic process of reciprocal accomodation and interaction between personal and environmental systems.

2. Personality itself is a system in interaction with surrounding personal and social systems.

3. Social network is a set of linkages among a defined set of persons, in such a way that the nature of these linkages as a whole may be used to interpret and predict the behaviors of the persons involved. The broader social system consists of smaller constellations of social networks.

4. A behavior setting is a standing pattern of behavior that has a definite time and space, but does not depend on specific persons.

### PROCESS CONCEPTS

5. Problems belong to a system, not an individual.
6. Both personal and environmental systems are only partial sources of behavior.
7. What affects the person also affects the environment; what affects one network member affects all others.
8. A social network has a natural helping effect as a function of the support available to the person at each level of the network.

In ecological assessment the task is to identify the person's social support networks, and to appraise how the person seeks social support to cope with problems. In ecological interventions that go beyond assessment, the task is to help the individual (or groups) understand these processes and concepts, and to promote their maximum utilization of available ecological resources (human and material) and sources, to deal with the stresses of everyday living.

### THE ECOLOGICAL MODEL OF EFFECTIVE ACADEMIC FUNCTIONING

#### Description of the EcoModel

The ecological model used in this study draws heavily from Nuttall, Nuttall, and Pedalino's adaptation of Bronfenbrenner's work, and may be described as follows:

#### ECOLOGY

##### Personal

- Psychological Resources
- Skills and Competence
- Material Resources

##### Systemic

- Microsystem
- Mesosystem
- Exosystem
- Macrosystem

Process

Stresses

Coping Strategies

Social Support Networks

These aspects may be further described as follows:

Ecology

I- Personal Level. We examined the personal resources of each student in the sample. Even though we are aware that other factors may contribute to effective academic functioning, we limited our attention to three areas:

1. Psychological Resources. This component included: Intelligence; Self-concept; Personality Traits: Independence, Persistence, Ambition; Cultural Background, and Locus of Control.
2. Skills and Competence. This realm includes Command of English, Study Habits, and Quality of High School Education.
3. Material Resources. This area included: Income, Savings, and Ownership.

II- Systemic Level. We moved from the focal person to his social-systems network:

4. Microsystem. We included the immediate family of the student and others living in the same household.
5. Mesosystem. This level of the system is composed of the student's extended family and friends.
6. Exosystem. This level includes the various agencies and organizations that serve the student.
7. Macrosystem. We included here the values and goals of the student which are culturally learned and shared. We focused specifically on cultural values regarding academic achievement.

These structures are illustrated in Figure 1, which shows

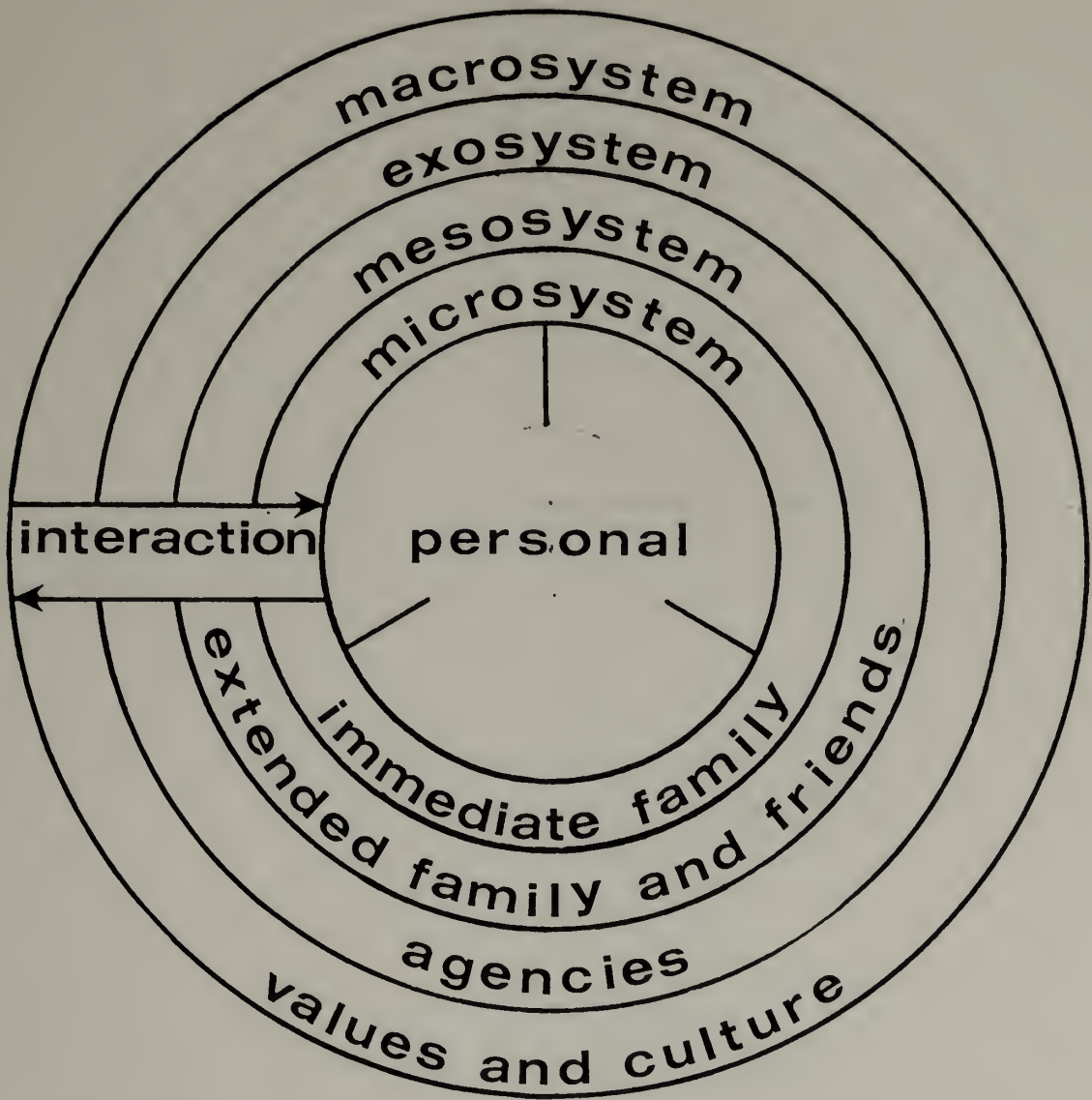


Figure 1. Structural Ecology of Academic Functioning

the total model. Innermost rings are not shared, but as the rings continue out, more and more people share them. Interaction flows both ways across the ring boundaries.

III- Process Level. Once we examined the personal and social structures of the ecology of academic functioning, we studied how students function to succeed in college. To understand these processes we adapted a model composed of stress, social support, and coping, developed by Nuttall, Nuttall, and Pedalino in their 1978 study. Figure 2 illustrates the model.

8. Stresses. Stresses originating from any level of the system impact the student who in turn requires the selection of a coping strategy. Two stress indices were used in this study: an index of stresses owing to human needs (personal) and another index of stresses that stem from the social system.

9. Coping Strategies. When a student is faced with stress, the situation must be dealt with. A coping strategy is simply the proportion of resources and the absolute amount of resources a student draws from each level of the ecological system to overcome a stress.

10. Social Support Networks. Some students obtain support from only one level of the system while others have multi-level support systems. Our analysis of the different social systems looked for sources of support available to the student within the realm of each system or group.

Building on the work by Nuttall, Nuttall, and Pedalino (1978) we identified two groups of strategies:

- a- major strategies for coping with academic demands, and
- b- strategies for increasing the student's resource capability.

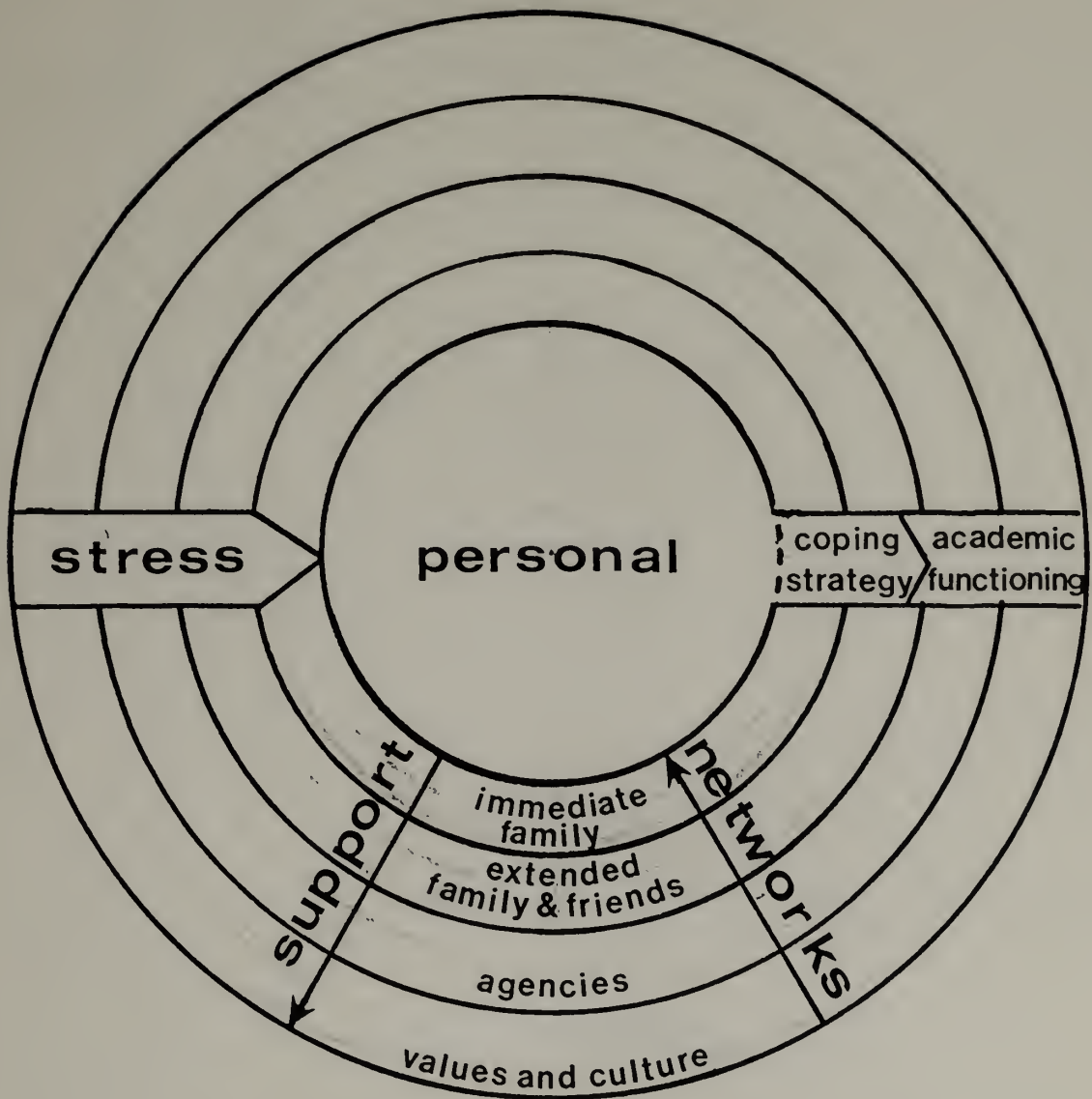


Figure 2. Process Model of Academic Functioning

## Description of Major Coping Strategies

### Strategy 1 Uses Personal Resources Primarily

Under this category, the student accepts primary responsibility for his own life and attempts to meet as many stresses as possible out of his own resources. This strategy may include use of immediate family and other resources as needed, but the primary responsibility for meeting student needs is from the personal resources of the focal person.

### Strategy 2 Uses Immediate Family Resources Primarily

Under this category, the student sees the immediate family, often the parents or older siblings, as the primary sources for meeting student needs. Resources from other levels may also be used, but primary reliance is on members of the immediate family.

### Strategy 3 Uses Extended Family Resources Primarily

Here, the focal person relies heavily on the provision of resources from the extended family. An example might be the young student heavily subsidized by relatives living elsewhere.

### Strategy 4 Uses Friends' Resources Primarily

This strategy entails heavy reliance on friends, for example, living in a friend's house or otherwise heavily depending on non-family and non-personal resources. Friends may be school friends, roommates, neighbors, or friends from other sources.

### Strategy 5 Heavy Reliance on Agencies

Under this category, the focal student depends heavily on agencies to provide resources for meeting students needs. The student essentially could not function without the assistance of agencies.

### Strategy 6 Heavy Reliance on Values and Culture

This strategy involves the use of cultural or value centers for sources or resources, as with religious people who "trust in God" to provide for them.



## Description of Strategies for Increasing Resource Availability

In addition to strategies for immediate needs, students usually exhibit a pattern of behavior which is itself a strategy for increasing the resources available to them in the long run. These long-range strategies are more relevant for policy decisions.

### Strategy 7 Builds Up Personal Resource Capability

This includes attempts to improve self in any of three areas: psychological, skills, or material. Obtaining psychological counseling would be an attempt to build up the student's psychological strength, going to school would increase skills, while buying a car or typewriter would increase material strength.

### Strategy 8 Builds Up Immediate Family Resource Capability

This strategy might include assisting parents or siblings to increase their own personal resource capabilities.

### Strategy 9 Builds Up the Resource Capability of Friends or Extended Family

It is typical in some cultures for extended family members to take the responsibility of assisting other members to increase their resource capabilities.

### Strategy 10 Builds Up the Resource Capability of Agencies

As agencies depend on resource input, efforts can be made to increase their size, quality, and responsiveness. For example, agencies can be strengthened by financial or political support, or by making them more culturally meaningful.

A student may pursue more than one of these strategies and the various strategies are not mutually exclusive. A person may not be totally aware of what he or she is doing in following any of these strategies.

### Effective Academic Functioning

The end product of this process is a certain level of academic functioning. Although we relied primarily on Grade Point Average (GPA) to determine the overall quality of academic functioning of each student in the sample, we recognize the fact that grades are only partial indicators of the overall level of functioning that students exhibit.

Essentially, the effectiveness of each student's academic functioning is the degree to which the coping strategy reduces stress and supports academic progress. Student's effectiveness can be defined in terms of the effectiveness of their long and short term strategies.

## C H A P T E R   I I I

### RESEARCH METHODOLOGY

The method of empirical research employed in this study is ecological because it studies the structural aspects of academic functioning (i.e.: person and environment) as well as the relationship or process aspects (i.e.: stress and coping). This chapter is organized around the following general objectives:

1. to describe the methodology that was used in this study
2. to contextualize the study in its proper social setting, and
3. to specify the research strategies used to study the academic functioning of Puerto Rican college students.

### Research Setting

The University of Massachusetts at Amherst is the state university of the Commonwealth of Massachusetts. It was founded in 1863 and consists of approximately 1,100 acres of land and 110 buildings. It accomodates a yearly enrollment of approximately 25,000 students. The University is situated near five other major colleges and universities which, together, bring the student population in the area up to approximately 50 to 60,000 students per year.

As part of its admissions policies, the University developed a special program for the recruitment and admission of minority students of Hispanic origin. The Bilingual Collegiate Program (BCP) as it is officially known, not only provides recruitment and admission services but also implements a complete program of academic and social support services . The BCP provided needed demographical data about the totality of Hispanic students at the University.

### Population and Sample

The population in this study was defined as all the Puerto Rican undergraduate students enrolled at the University of Massachusetts at Amherst during the spring semester of 1979. Ninety-six (96) students were identified in the master list as being both Puerto Rican and undergraduate. All ninety six were contacted by mail, informed about the nature and purpose of the study, and all were invited to participate in the study.

Samples of the letters of invitation sent to the student sample are contained in the Appendix. Of the ninety six identified Puerto Rican students, fifty-eight responded to our invitation, and actually participated in the study. These fifty eight included 29 female and 29 male students which were distributed as follows:

	<u>Academic Level</u>	
	<u>Freshmen and</u>	<u>Junior and</u>
	<u>Sophomore</u>	<u>Senior</u>
<u>Sex</u>	Female: 13	/ 16
	Male 13	/ 16

### Design

This is an ex post facto study of personal and ecological influences on academic functioning. Among the many possible influential variables, we selected seventeen independent variables for systematic empirical scrutiny, according to the EcoModel.

### Instrumentation

Of the totality of instruments utilized in this study, those that are copyrighted have not been included herein. A brief description of the copyrighted instruments used, along with the instruments developed specifically for this study

are contained in the Appendix. The measures of independent variables have been arranged according to the EcoModel, and are specified next.

### Measures of Independent Variables

#### Personal Level

##### A. Psychological Resources

##### Variable 1: Intelligence

Assessment of subjects' intelligence was completed through a group administration of the Wechsler Adult Intelligence Scale-Vocabulary Sub-test and a Self-Report of Intellectual Ability developed for this study.

The WAIS Vocabulary subtest measures verbal reasoning and intellectual ability. Vocabulary is considered the best single measure of general intelligence (Zimmerman and Woo-Sam, 1973). The sub-test is composed of 40 words to be defined, listed in order of difficulty. It has a three-level scoring system as follows: 2 points for sufficiently abstract and accurate responses, and 1 point for descriptive, concrete, functional, or vague responses. Inferior synonyms or inexact definitions are given no point.

The Self-Report of Intellectual Ability consists of two items which aim to compare measured intelligence with student's own perceptions of their intellectual ability. The items are described in the Appendix.

Variable 2. Self-Esteem

This is a measure of each student's self concept designed by Rosenberg(1965) and entitled Self-Esteem Scale. The scale measures self-attitudes along a favorable-to-unfavorable dimension, and is composed of ten items requiring one of four answers: strongly agree, agree, disagree, strongly disagree. Positively and negatively worded items are presented alternately to reduce the possibility of response set.

The next instrument is a Personality-Traits Self-Rating Scale which was developed for this study to measure the following three variables:

Variable 3. Independence

Variable 4. Persistence

Variable 5. Ambition

Subjects were asked to compare themselves with other students with whom they went to school, using a rating scale provided for this purpose.

Variable 6. Cultural Background

This factor was assessed with the Cultural Background Questionnaire, an eleven-item instrument developed for this study which covers ethnic background, time spent in the United States, language(s) spoken, cultural affiliation, parent's occupation, education, and command of the English language.

Variable 7. Locus of Control

To measure each subject's beliefs on whether he is responsible for his progress or whether external factors beyond

his control affects his progress, we used the Intellectual Achievement Responsibility Questionnaire by Crandall, Katkovsky, and Crandall (1965). The scale is composed of thirty-four forced choice items. Each item describes either a positive or negative achievement experience that routinely occurs in students' lives. The item is followed by one alternative stating that the event was caused by the student and another stating that the event occurred because of the behavior of someone else in the child's immediate environment.

#### B. Skills and Competence

##### Variable 8. Command of English

This is a measure of students' language proficiency in English. We relied on the Michigan Test of English Language Proficiency (MTELP-Form A, 1962) which was designed as part of a battery to estimate whether a student whose native language is not English is able to pursue academic study in an English language college or university. The instrument covers grammatical usage, vocabulary, and comprehension.

##### Variable 9. Study Habits

This was a brief form of the Study Habits Questionnaire by Preston and Botel (1956) originally developed for use with college students. Our adaptation consisted of nineteen items that measured students' habits in the following areas: use of time, physical setting, reviewing, reading, taking notes, recall, and taking exams.

##### Variable 10. Quality of High School Education

This is a nineteen-item questionnaire that measures



various aspects of the educational experience subjects received prior to their entering college. The questionnaire covers academic program, school size, area, and other general information. In addition, there is a five-item semantic-differential scale covering general, bilingual, individualized, tutorial, corrective, and enrichment aspects of the curriculum.

### C. Material Resources

#### Variable 11. Material Resources

This instrument is in the form of a Material Resources Checklist developed for this study, which covers income, savings, and ownership of material objects relevant to college life.

#### Systemic Level

The next set of measures is geared to assess the system's support of student functioning. These were included in questionnaire form and arranged to cover material, emotional, educational, and social support factors:

#### Variable 12. Immediate Family Support

#### Variable 13. Extended Family and Friends Support

#### Variable 14. Organizational Support

All three measures involve the same item: how much do the following people help you in the following areas? Subjects were asked to rate the amount of support they receive from the different levels of their social environment using a key provided for that purpose.

Variable 15. Cultural Values Regarding Academic Achievement

This is a measure of students' values and students' perception of parental values. We asked subjects what they thought was expected of them, their goals and relative preferences for possible situations pertaining to academic achievement, as well as their perception of cultural mandates upon parents regarding student academic achievement, and parental goals.

Process Level

Variable 16. Human-needs Stresses

Two stress indices were used in this study, one to measure human needs, and the other to measure stresses stemming from the academic system. We used a category system of needs, and rated each factor on the extent to which it is a stress factor for a given individual. This category system is further described in the Appendix.

Variable 17. Academic System Stresses

We used a category system of stresses similar to the one above, and rated each factor on the extent to which it is a stress factor for a given student.

Statistics

This study relies principally on factor and multiple regression analysis, because they are the statistical techniques most appropriate for the research model designed. These techniques

have the capacity to mirror, with high fidelity, the complexity of the relationships that characterize the behavioral sciences (Cohen and Cohen, 1975). The Statistical Package for the Social Sciences (SPSS) program was used to compute the analyses.

### Procedures

This study was completed following these steps:

#### 1. Pilot Student Interviews

The first field effort was to interview a small group of second and fourth year students. These interviews were to pilot test the research instruments to be able to modify and strengthen these as necessary.

#### 2. Analysis of Pilot Data and Revision of Method

Information from the interviews was analyzed and appropriate modifications made wherever any was needed.

#### 3. Second Data Collection and Analyses

This was the first comprehensive gathering of data. All measures in the research battery were administered in consecutive morning and afternoon sessions. Subjects had been contacted by mail and were advised to attend the session that best met their individual schedules. The research battery took about one hour to be completed.

#### 4. Data Feedback to Student Sample

One methodological feature borrowed from Todd (1978) was to emphasize the utility of the research findings for the participants. To accomplish this, follow up contact with these students is anticipated to share findings, and to derive implications in the context of our history as a minority group in the United States. This contact will be in the form of written material to be distributed among the sample.

## C H A P T E R I V

### STATISTICAL ANALYSES AND RESEARCH FINDINGS

No attempt was made to derive conclusions or recommendations within this chapter as these are gathered in the next and final chapter of the study. The following objectives guide this chapter:

1. to present the major descriptive findings regarding the final sample studied
2. to describe the salient statistical findings that emerged from analyses of the seventeen clusters of independent variables measured.

## DESCRIPTIVE FINDINGS

### Demographic Findings

Sex, Age, and Academic Level. The fifty-eight (58) students that participated in the study represent over 50% of the defined research population. Twenty-nine (29) of the students were female and an equal number were male. In regards to age, 32 students were 25 years of age or younger, 8 were between 26 and 40 years old, and 18 did not report their age.

Twenty-six (26) of the students were at the freshmen-sophomore level and 32 were at the junior-senior level.

Major Field of Study. Education was the field of major study which showed the highest frequency of students, accounting for 25.9% of all declared majors in the sample. Education was followed by Casiac which is a denomination for students who have not declared a definite major field of study. Casiac accounted for 12.1% of the majors in the sample, and was followed by Physical Education which accounted for 10.3%, and Zoology which accounted for 6.9%. It is interesting to note that Psychology and Sociology each account for 5.2% of the majors. The remaining 24.0% of the majors are evenly distributed among twelve other fields of major study. This means one student per major. Ten percent of the sample (10.0%) did not answer this item.

Grade Point Average. Since grade point average was used as the dependent variable in the study it is illustrated in detail in Table 1.

Table 1

<u>Frequencies of Grade Point Average</u>	
<u>GPA</u>	<u>Relative Frequency</u>
3.5-4.0	7
3.0-3.49	18
2.5-2.99	19
2.0-2.49	5
1.5-1.99	2

N= 51

Whereas 86.0% of the sample was in good academic standing, a large 43.9% were in very good or honor standing (i.e.: 3.0 and up).

### Findings that Describe the Personal Variables

#### I- Psychological Resources

Intelligence. Eighteen percent (18.2%) of the sample reported their intelligence to be at the superior to very superior range of intelligence, 78.2% reported to be above the average range, and 3.6% reported to be below the average range of intelligence.

In contrast with these findings, measured intelligence was found to be distributed among the sample as follows: 50.0% scored below the average range of intelligence, 14.3% scored at the average range. 25.0% scored above the average range, and 10.7% scored at the superior range of intelligence.

Sixteen percent (15.8%) of the sample had never received an academic award or prize, 42.1% had received between one and three,

42.1% had received more than four academic awards or prizes.

Self-Esteem. Ninety-three percent (93.0%) of the students in the sample were satisfied with their own selves, 46.6% felt they were no good at times, 100% felt that they had a number of good qualities, 94.8 % felt that they could do things as well as most other people, 89.5% felt that they were a person of worth at least on an equal plane with others, 20.7% felt they did not have much to be proud of, 56.1% felt useless at times, 58.6% wished to have more respect for themselves, and 96.6% took a positive attitude toward themselves.

Personality Traits. Eighty-nine percent (89.1%) of the sample considered themselves to be as independent or more than the majority of the students with whom they attended school. Ninety seven percent (96.6%) considered themselves to be as persistent or more than the majority and 91.2% felt they are as ambitious or more than the majority of the students.

Cultural Background. Of the total student sample 90.0% was born in Puerto Rico. Regarding the students' immediate and extended family birthplace, only four (4) mothers and four (4) fathers were not born in Puerto Rico; only 8 maternal grandparents and 9 paternal grandparents were not born in Puerto Rico.

Regarding the place where students grew up and time spent in the United States, 77.6% grew up in Puerto Rico, 17.2% grew up in the United States, and 5.2% grew up in both Puerto Rico and the United States. Forty-seven percent (47.0%) of the sample has spent between one (1) and five (5) years in the United States, 46.0% has spent between six (6) and fifteen (15) years, and 7.0% has spent over fifteen (15) years in the United States.

Eighty-three percent (82.5%) of the sample reported their



ethnic background to be Puerto Rican, 3.5% reported to be predominantly Puerto Rican and somewhat American, 12.3% reported to be both Puerto Rican and American, and 1.8% which is equivalent to 1 student reported to be predominantly American and somewhat Puerto Rican.

Parental Education and Occupation. Seventy-four percent (73.8) of the mothers have a high school level diploma whereas only 67.9% of the fathers do. Likewise 17.6% of the mothers have either an associate or bachelor degree whereas only 10.7% of the fathers do. However, only 3.6% of the mothers have a master or doctoral degree whereas 16.0% of the fathers do. Five percent (5.0%) of the mothers and 5.0% of the fathers have no education.

Over 50.0% of the mothers either did not know or had very poor ability to speak, read, or write the English language. Forty seven (46.5%) of the mothers had good command of the English language. Forty-one percent (41.0%) of the fathers had no or very poor ability to speak, read or write in English, and 59.0% had good command of the English language.

Sixty-nine percent (69.0%) of the mothers are homemakers, 6.9% are unskilled workers, 8.6% are skilled workers, and 10.3% are professional. Five percent (5.0%) are unemployed.

Sixteen percent (16.%) of the fathers are unskilled workers, 26.8% are professional, 26.8% are unemployed, and 30.4% did not report their occupation.

Locus of Control. Forty-four percent (44.1%) of the sample exhibited an internally oriented locus of control, 9.3% showed a balanced internal-external orientation, and 46.5% showed an externally oriented locus of control.

## II- Skills and Competence

Command of English. Forty-three percent (42.8%) of the sample had poor or no command of English, 21.4% had some command of the language and 35.7% had good or excellent command of the

English language.

Study Habits. As this area was measured with an instrument which incorporated very heterogeneous items, the data gathered from it has been analyzed via factor analysis technique. Results from the analysis are presented in the statistical section of this chapter.

Quality of High School Education. Fifty-seven percent (56.9%) of the sample spent their high school years in Puerto Rico and 43.1% spent theirs in the United States, 46.6% graduated from high school in Puerto Rico, and 50.0% graduated in the United States; 3.4% graduated in places other than Puerto Rico or the United States.

In terms of the kind of high school attended by the sample, 1.7% attended private non-religious schools, 32.8% attended private religious schools, and 65.5% attended public schools.

School location was reported to be in a rural area for 19.3% of the sample, in a suburban area for 19.3% and the remaining 61.4% attended inner city schools.

School size was reported by 13.8% of the sample to be small, 34.5% reported medium size schools, 22.4% reported large schools, and 29.3% reported having attended very large schools.

In terms of the kind of program undertaken, 71.4% attended a general academic program, 10.7% attended a commercial program, 3.6% attended a technical program, 5.4% attended a vocational program, and 8.9% hold a general equivalency diploma.

Of the totality of schools attended, 57.4% offered a program of bilingual instruction whereas 42.6% did not. Only 13.7% of the sample finished high school with a grade point average of 2.49 or under, 64.7% finished with GPA's that fell between 2.5 and 3.49, and 21.6% had GPA's of 3.5 and above.

For 29.4% of the sample the program of bilingual instruction offered in their schools was not important, 23.5% had no feelings

about it, and 47.0% felt the program was very important to them. Similarly, 16.7% of the students felt that tutorial instruction in their schools was not important to them, 42.6% had no feelings about it, and 40.8% felt that tutoring was very important to them.

### III- Material Resources

Income. Twenty-eight percent (27.6%) of the sample reported having an income from employment sources, 12.1% had savings in the bank, and 5.2% had work loans. Parents, extended Family and friends were reported to be the least contributing sources to the student's income (6.8%). Fellowships were enjoyed by 17.2% of the students, 13.8% had an income from work-study sources, and 12.1% were Social Security or Welfare recipients.

Finances. In describing their finances, 32.8% said they were barely able to make a living, 31.0% had the necessities, 27.6 reported comfortable finances, and 8.6% reported a well-to-do financial status.

Ownership. Forty-five percent (44.8%) of the sample owned an automobile, 32.8% owned a T.V. set, 31.0% owned a radio, 29.3% had telephones, 17.2% owned a typewriter, 17.2% owned a tape recorder, 12.1% owned a phonograph, 10.3% owned a calculator, and 10.3% owned a dictionary and other educational reference materials.

The necessary income comes from one or more of the following sources: employment, parents, extended family, friends, fellowships, work study, Social Security or Welfare. The majority of effective students have a comfortable financial status. Having an automobile, a T.V. set, a radio, and a telephone was more frequently reported by students than was having a typewriter, tape recorder, phonograph, calculator or a dictionary.

### Findings that Describe the Systemic Variables

#### IV. Support Systems

Support-System Networks. Support to students was measured in four areas: material, educational, emotional, and social support. Data from this instrument were gathered for three levels of the

EcoModel: the micro, meso, and exosystems. Support from the macrosystem was defined in terms of cultural values, which are described later in this chapter.

Table 2 illustrates the major findings regarding the support received by students from each of the three levels of the social system that were measured with the Support Systems Questionnaire.

(place Table 2 approximately here)

Within the microsystem, mothers were the single most helpful member of the family in terms of emotional, material, educational, and social support to students. Fathers followed with a lot of support to students emotionally, materially, and educationally, in that order. Sisters were very helpful emotionally and socially. Brothers were the least helpful to the students in all areas of support,

Table 2  
Support Received by Students from the Micro System

	KIND AND EXTENT OF SUPPORT											
	Material			Educational			Emotional			Social		
	Not Helpful	Helpful	Extremely Helpful	Not Helpful	Helpful	Extremely Helpful	Not Helpful	Helpful	Extremely Helpful	Not Helpful	Helpful	Extremely Helpful
SYSTEM	1	2	3	1	2	3	1	2	3	1	2	3
<u>Microsystem</u>												
Mothers	30.9	21.8	47.2	69.3	25.0	5.8	14.5	21.8	63.6	34.0	35.8	30.2
Fathers	31.9	34.1	34.0	72.4	14.9	12.8	28.3	26.1	45.7	42.6	42.6	14.9
Sisters	46.8	38.3	14.9	69.5	23.9	6.5	31.3	25.0	43.8	29.2	39.6	31.3
Brothers	54.2	35.4	10.5	77.1	18.7	4.2	33.4	33.3	33.3	54.1	18.8	27.1

Table 3

Support Received by the Students from the Meso and Exosystems

	Kind and Extent of Support											
	Material			Educational			Emotional			Social		
	1	2	3	1	2	3	1	2	3	1	2	3
<u>SYSTEM</u>												
<u>Mesosystem</u>												
Extended Family	63.4	34.2	2.4	70.0	22.5	7.5	45.0	28.6	26.2	50.0	35.0	15.0
Puerto Rican Friends	54.9	39.2	5.9	26.4	52.8	20.8	14.5	52.7	32.7	7.3	41.8	50.9
American Friends	71.4	24.4	4.1	38.5	44.2	17.3	44.0	36.0	20.0	28.3	37.8	33.0
P.R. roomates	40.9	45.5	13.6	39.1	39.1	21.7	33.3	29.1	37.5	23.0	23.0	53.8
American roomates	58.6	34.4	6.9	38.4	38.7	12.9	46.7	33.3	20.0	40.7	34.4	25.0
<u>Exosystem</u>												
Financial Aid Office	11.8	37.3	51.0	70.5	13.6	15.9	73.8	21.4	4.8	77.5	12.5	10.0
Major Department	68.7	22.9	8.4	33.3	43.1	23.5	61.2	22.5	16.3	60.0	28.9	11.1
Academic Advisor	73.2	17.1	9.7	23.4	40.4	36.1	49.0	25.5	25.5	65.9	26.8	7.3
Teachers	67.4	22.4	10.2	16.3	47.3	36.3	32.7	49.1	18.1	48.0	37.5	14.6

Table 3  
Support Received by Students from the Meso and Exosystems  
(continued)

	Kind and Extent of Support											
	Material			Educational			Emotional			Social		
	1	2	3	1	2	3	1	2	3	1	2	3
<u>Exosystem</u> (continued)												
BCP	29.8	40.4	29.8	5.7	46.2	48.1	21.2	51.9	26.9	4.0	49.0	47.0
Ahora Organization	76.8	20.9	2.3	75.6	22.0	2.4	82.5	15.0	2.5	23.4	46.8	29.7
Legal Services	91.6	8.4	0	87.5	9.4	3.1	85.2	8.8	5.8	93.6	6.4	0
Psychological Service	96.8	3.2	0	96.6	.1	3.3	97.1	0	2.9	96.6	0	3.3
University Health Ctr	53.5	32.6	14.0	81.1	10.8	8.1	60.0	30.0	10.0	83.8	10.8	5.4
University Mental Health Center	90.4	3.2	6.5	84.4	12.5	3.1	87.9	6.1	6.1	91.1	5.9	2.9
Welfare	54.0	29.7	16.2	84.4	6.2	9.4	87.9	9.1	3.0	83.9	13.0	3.2
Veterans Administration	92.6	3.7	3.7	92.6	3.7	3.7	95.8	0	4.2	100.0	0	0

Within the mesosystem Puerto Rican friends and college roomates were the most helpful group to the students in the sample. Extended family members were generally not perceived as helpful, except in the area of emotional support where a very large percentage of the sample reported them to be helpful or extremely helpful.

Within the exosystem, the financial aid office, the Bilingual Collegiate Program, the University Health Center, and the Welfare Department were perceived by the students as the most helpful agencies, materially.

The student's major department, academic advisors, teachers, the BCP, and Ahora Organization were perceived as the most helpful agencies in terms of educational support, in that order.

In regards to emotional support the BCP, teachers, academic advisors, the major department, and Ahora Organization were perceived as the most helpful agencies, in that order.

Socially the most helpful agencies were reported to be the BCP, Ahora Organization, teachers, and the major departments, in that order.

It is important to note that the Bilingual Collegiate Program is perceived as one of the most supportive agencies of the exosystem, in all four areas of support. Similarly, Ahora Organization is perceived as being very helpful in three of the four areas of support.



Cultural Values Regarding Academic Functioning. This measure gave scores for students and their parents, which are presented in Table 4.

Table 4

<u>Cultural Values of Students and Parents</u>	
<u>Value</u>	<u>Percentage of the sample holding specific values</u>
	<u>STUDENTS</u>
To attend class most of the time	98.3%
To obtain high scores on exams	89.6
To participate in class	81.0
To be among the best in your class	70.7
To read books of general interest	81.1
To participate in sports or gymnastics	53.5
To complete assigned readings	94.8
To graduate	100.0
To be awarded an academic honor	68.9
To know the answers in class	91.4
To get good grades	96.6
To pass grade	100.0
To know about things in general	94.9
To have a high grade point average	91.1
To get a good job	96.6
To be elected class president	31.3
To get a scholarship	65.5
To better your standard of living	98.3
To be admitted to graduate school	82.8
To be better prepared than the opposite sex	39.7
To graduate in order to help your community	89.6
To be a good student because God wants you to be	32.8
	<u>PARENTS</u>
That student attend class most of the time	91.4
That student participate in class	82.7
That student study for exams	89.7
That student do assignments	86.2
That student read books of general interest	79.3
That student participate in sports or gymnastics	48.3
That student graduate	98.3

Table 4  
(Continued)

Cultural Values of Students and Parents	
Value	Percentage of the sample holding specific values
<u>PARENTS</u>	
That student be awarded an academic honor	74.1
That student get good grades	96.6
That student pass grade	96.6
That student learn about things in general	91.1
That student keep a high grade point average	91.0
That student raise parents standard of living	56.4
That student raise own standard of living	96.4
That student be admitted to graduate school	81.8
That student become famous someday	50.0
That student help their community	85.7
To carry God's mandate that parents are responsible for their children.	69.1

Within the macrosystem, the most important values to the students were: to obtain high scores on exams, to read books and complete assigned readings, to graduate, to know the answers in class, to get good grades, to know things in general, to get a good job, and to better their standard of living. Values most important to parents were: that the student attend class, graduate, get good grades, pass grade, learn about things in general, keep a high GPA, and that the students raise their own standard of living and that of their community.

#### Findings that Describe the Process Variables

##### II- Stresses

Human-Needs Stresses. Table 5 illustrates the various stress factors that affected the student sample during their college years.

Table 5

Extent of Human-Needs Stresses on Students' Academic Functioning

Factor	Percentage of the sample experiencing specific stresses		
	minimal or small	some	major or very large
	Food	31.0%	19.0%
Clothing	29.3	29.3	41.3
Furniture	39.7	37.9	22.4
Housing	22.4	24.1	53.4
Income	12.1	17.2	70.7
Transportation	20.7	36.2	43.1
Medical Needs	29.3	25.9	44.8
Child Care	58.9	5.4	35.7
Daily Living Needs	20.7	36.2	43.1
Protection	31.0	32.8	36.2
Employment	16.1	28.6	55.4
Education	17.2	15.5	67.2
Recreation	17.2	43.1	39.7
Legal Services	42.1	31.6	26.3
Information Needs	28.1	43.9	38.1

The human-need stresses that most affected the students in the sample were: income, employment, education and recreation needs, followed by daily living, housing, and transportation needs, in that order.

Academic System Stresses. Table 6 illustrates the various stress factors from the academic system and the physical setting.

Table 6

Extent of Academic System Stresses on Students' Academic Functioning

Factor	Percentage of the sample experiencing specific stresses		
	minimal or small	some	major or very large
Fees and Tuition	10.5	26.3	63.2
Course Load	7.1	26.8	66.1
Rules and Regulations	21.4	46.4	32.1
Teachers' Sex	78.6	12.5	9.0
Teachers' Race	71.9	17.5	10.5
Dormates	48.2	25.0	26.8
Roomates	50.9	19.3	29.9
Classmates	42.9	35.7	11.5
Termpapers	1.7	32.8	65.5
Written Assignments	5.2	32.8	62.1
Research Assignments	6.9	31.0	62.1
Classroom Language	38.6	47.4	14.0
Textbook Language	25.9	41.4	32.8
Exams in General	5.2	32.8	62.0
Final Exams	1.8	21.4	67.8
Buildings	52.6	38.6	1.8
Weather	10.7	42.9	46.5
Classroom Setting	42.9	44.6	12.5

The academic system stresses that most affected the students were: term papers, final exams, written and research assignments, exams in general, course load, fees and tuition, the weather, rules and regulations.

STATISTICAL FINDINGSFactor Analyses

To determine the main clusters of effects in the various measures in the study that were internally heterogeneous in terms of their item composition, factor analyses were computed in a stepwise fashion consistent with the levels of the EcoModel.

Factor Analyses of Personal Variables

This type of statistics was computed for the following measures of personal variables: cultural background, study habits, and quality of high school education.

Cultural Background. This was one of the most heterogeneous instruments in the study in terms of its internal composition of items. The following table presents the factor loadings that were obtained through a four-factor varimax rotation solution for the cultural background data.

Table 7

Four-factor Varimax Rotation Solution for the Cultural Background Data

Data	Rotated Factor Loadings			
	1	2	3	4
Maternal Grandmother Born in Puerto Rico	.098	.094	-.890	.092
Maternal Grandfather Born in Puerto Rico	.215	.155	-.814	.216
Paternal Grandmother Born in Puerto Rico	.258	.143	-.116	.875
Paternal Grandfather Born in Puerto Rico	.237	.255	-.273	.573
Mother Born in Puerto Rico	.037	.240	.783	.399
Father Born in Puerto Rico	-.008	-.179	-.143	.811
Student Born in Puerto Rico	.345	-.164	.001	.760
Time in the United States	-.187	-.801	.241	-.080
Place Where Student Grew Up	-.029	.771	-.038	-.155
Language	-.167	.736	.187	-.286
Ethnic Background	.165	-.621	-.189	.206
Mothers' Occupation	.347	.040	.141	.398
Fathers' Occupation	.293	.020	-.343	.266
Mothers' Education	.600	.270	-.404	.226
Fathers' Education	.615	.029	-.557	.293
Mothers' English: Speaking	.797	-.226	.006	.357
Mothers' English: Reading	.881	-.067	.106	.198
Mothers' English: Writing	.881	-.171	-.001	.267
Fathers' English: Speaking	.786	-.040	-.397	.050
Fathers' English: Reading	.795	-.054	-.385	.083
Fathers' English: Writing	.791	-.033	-.408	.073

Note: Factors marked with the line had the highest loadings.

Of the variables entered in Table 6, Factor 1 is Parental Education and English Ability, and it had substantially high loadings from a third of the items in the scale. Factor 2 is Time Spent in the United States which received high loadings from four items in the scale which included two items that covered students' language preference and ethnic identity.

Factor 3 is Maternal Family Birthplace which received high loadings from items covering maternal grandparents birthplace and maternal birthplace. Factor 4 is Paternal Grandparents and Fathers Birthplace which received high loadings from four items in the scale.

Study Habits. Data from this instrument was similarly factor analyzed with a four-factor varimax rotation solution, with the following results:

Table 8

Data	<u>Rotated Factor Loadings</u>			
	1	2	3	4
Keeps assignments on time	.494	.172	.500	-.122
Writes down study time	.740	.268	.151	.113
Distributes time well	.819	.235	.107	.158
Clears space on a desk to study	.196	.676	.053	.074
Studies in a quiet place	.069	.760	.311	-.098
Studies alone	-.079	.640	.083	.398
Sits at desk with needed materials	.240	.775	.064	.060
Looks through chapter before reading	.285	.090	.747	.106
Uses headings, subtitles, illustrations	.227	.197	.840	.109
Completes assigned readings	.207	.104	.727	.317
Finds the primary ideas in readings	.131	.259	.229	.671
Looks up the meaning of new words	.233	.022	.180	.861
Take notes as you read	.503	-.129	.381	.383
Reviews class notes	.766	-.037	.336	.241
Understands class material	-.064	.039	.626	.311
Summarizes class material	.115	-.063	.162	.124
Relates material from various courses	-.012	.390	.565	.074
Prepares well for exams	-.664	-.003	-.016	-.063
Combines text notes with class notes	.563	.119	.533	.166

The first Factor is Reviewing and Preparing for Exams, Factor 2 is Physical Setting, Factor 3 is Reading and Reviewing, and Factor 4 is Reading Habits. It may be noted that the factor structure identified includes variables from the personal and systemic levels of the EcoModel.

Quality of High School Education. The solution performed on this cluster of data resulted in the following factor loadings:

Table 9

Five-factor Varimax Rotation Solution  
for Quality of High School Education Data

Data	Rotated Factor Loadings				
	1	2	3	4	5
Place of high school years	.232	-.380	.039	-.666	.156
Graduated from high school	.108	-.388	-.049	-.749	.022
Kind of school	.138	.016	.173	-.701	-.125
Kind of program	.074	.014	.060	.105	.870
School location	-.051	.847	.046	-.004	.054
School size	.192	-.236	.151	.568	.170
Bilingual instruction	.060	.697	.141	.061	-.047
High school G.P.A.	.094	.112	-.111	-.094	-.125
Instruction in general	.729	-.310	.679	-.057	-.209
Bilingual instruction	.830	-.027	.800	.247	-.062
Tutorial instruction	.237	-.098	.763	.070	.233
Corrective instruction	.740	.008	.033	-.083	.407
Special activities	.807	.150	-.066	-.213	-.027

Factor 1 is Instruction and Special Activities, Factor 2 is High School Location and Bilingual Instruction, Factor 3 is Bilingual Instruction and Tutoring, Factor 4 is School Kind and Size and Factor 5 is Kind of Program.

#### Factor Analyses of Systemic Variables

Factor analytic statistics were computed for the following

measures of systemic variables: support systems and cultural values.

Support-System Networks. The following table illustrates the six-factor varimax rotation solution that was computed for the support systems data.

Table 10

Data		Rotated Factor Loadings					
		1	2	3	4	5	6
Material Support:	Mothers	.346	.041	-.187	.035	-.723	.261
"	: Fathers	.825	.026	.034	.025	-.352	.196
"	: Sisters	-.104	.762	-.031	.010	-.420	.076
"	: Brothers	.066	.033	-.108	.195	-.791	.109
Educational Support:	Mothers	.203	.121	-.284	.803	-.061	.178
"	: Fathers	.710	.236	-.131	.472	.035	-.020
"	: Sisters	.085	.786	-.127	.407	.178	-.039
"	: Brothers	.000	.100	.017	.876	.204	.081
Emotional Support:	Mothers	.267	.276	-.131	.113	-.199	.755
"	: Fathers	.693	-.061	.034	.069	-.132	.568
"	: Sisters	.206	.702	-.113	.020	.018	.507
"	: Brothers	.156	.003	-.334	.168	-.212	.795
Social Support:	Mothers	.133	.136	-.848	.076	-.227	.182
"	: Fathers	.846	-.002	-.372	.005	-.032	.203
"	: Sisters	.089	.494	-.752	.040	.094	.064
"	: Brothers	.113	-.325	-.706	.326	-.269	.251



The identified factors in Table 9 are the following: Factor 1 is Fathers Support in All Areas, Factor 2 is Sisters Support in All Areas, Factor 3 is Immediate Family Social Support, Factor 4 is Immediate Family Educational Support, Factor 5 is Immediate Family Material Support and Factor 6 is Immediate Family Emotional Support.

Table 10 illustrates the factor solution computed for the Mesosystem support data.

Table 11

Four-factor Varimax Rotation Solution for the Mesosystem Support Data				
Data	Rotated Factor Loadings			
	1	2	3	4
Material Support: Extended Family	.295	.085	.234	-.608
" " : Puerto Rican Friends	.253	.132	.801	-.068
" " : American Friends	-.058	.260	.637	-.434
" " : P.R. College Roomates	.582	-.191	.532	-.045
" " : American College Roomate	.009	.062	.470	-.727
Educational Support: Extended Family	.440	.045	.182	-.627
" " : Puerto Rican Friends	.394	.453	.386	-.057
" " : American Friends	-.175	.553	.396	-.229
" " : P.R. College Roomates	.787	.024	.130	-.127
" " : American Roomates	.013	.074	.137	-.758
Emotional Support: Extended Family	.528	.292	-.101	-.524
" " : Puerto Rican Friends	.573	.412	.168	-.263
" " : American Friends	.008	.793	.243	-.371
" " : P.R. College Roomates	.816	.125	.071	-.010
" " : American Roomates	.111	.232	-.002	-.800
Social Support: Extended Family	.508	.371	-.110	-.445
" " : Puerto Rican Friends	.455	.389	.197	-.328
" " : American Friends	.002	.739	-.031	-.375
" " : P.R. Collège Roomates	.782	.006	.051	-.135
" " : American Roomates	.177	.250	-.254	-.688

The identified factors in Table 10 are the following: Factor 1 is Puerto Rican College Roomates and Friends Support, Factor 2 is American Friends Support, Factor 3 is Puerto Rican and American Friends and College Roomates Material Support, and Factor 4 is American College Roomates and Extended Family Support.

Table 11 illustrates the factor solution computed for the Exosystem support data.

Table 12

Data	Rotated Factor Loadings				
	1	2	3	4	5
<u>Material Support</u>					
Financial Aid Office	.134	-.235	-.325	-.177	-.056
Major Department	.247	.715	-.266	.155	.194
Academic Advisor	-.077	.696	-.270	-.011	.118
Teachers	.112	.560	-.257	-.106	.494
Bilingual Collegiate Program	.082	.418	-.494	-.007	.240
Ahora Organization	.592	.418	-.367	-.013	.047
Legal Services	.749	.083	-.111	-.222	.168
Psychological Services at Tobin Hall	.936	.039	-.066	-.148	.168
University Health Center	.324	.345	.243	.144	.554
University Mental Health Center	.604	-.088	.135	.265	.092
Other University Agencies	.173	.389	.567	-.136	.079
Welfare Office	.165	.135	-.183	-.614	.168
Veterans Administration Office	.162	.135	-.183	-.614	.168
Other Off-Campus Agencies	.763	.121	.205	-.306	.158

Table 12  
(Continued)

	Rotated Factor Loadings				
	1	2	3	4	5
<u>Five-factor Varimax Rotation Solution for the Exosystem Support Data</u>					
<u>Educational Support</u>					
Financial Aid Office	-.103	.280	-.160	-.497	.317
Major Department	.011	.750	.032	-.221	-.205
Academic Advisor	.074	.692	.021	-.157	.082
Teachers	.049	.538	-.007	-.328	.197
Bilingual Collegiate Program	.086	.273	-.425	-.222	.171
Ahora Organization	.716	.196	-.351	-.128	.002
Legal Services	.903	-.003	-.165	-.166	.081
Psychological Services at Tobin Hall	.943	.046	-.092	-.074	.166
University Health Center	.536	.063	.014	.149	.589
University Mental Health Center	.729	.158	.346	.050	.116
Other University Agencies	.043	.363	-.040	.036	.232
Welfare Office	.220	.371	.357	-.681	-.019
Veterans Administration Office	.098	.125	-.130	-.670	.037
Other Off-campus Agencies	.271	.039	-.078	-.262	.772
<u>Emotional Support</u>					
Financial Aid Office	.284	.039	-.067	-.178	.536
Major Department	.291	.733	.116	-.025	-.099
Academic Advisor	.099	.800	.004	-.088	.138
Teachers	-.053	.619	.007	-.289	.316
Bilingual Collegiate Program	.160	.185	-.652	-.017	.128
Ahora Organization	.701	.239	-.333	-.018	.040

Table 12  
(Continued)

Data	Rotated Factor Loadings				
	1	2	3	4	5
<u>Emotional Support (continued)</u>					
Legal Services	.783	.000	-.143	-.119	.172
Psychological Services at Tobin Hall	.937	.038	-.084	-.145	.169
University Health Center	.487	.391	-.150	-.096	.128
University Mental Health Center	.783	.270	.341	-.086	.135
Other University Agencies	.068	.365	.094	-.246	.406
Welfare Office	.139	.195	-.024	-.815	.018
Veterans Administration Office	.117	-.056	-.022	-.378	.809
Other Off-Campus Agencies	.860	.140	-.216	-.165	.172
<u>Social Support</u>					
Financial Aid Office	.420	.063	.220	-.232	-.063
Major Department	.160	.633	.088	-.246	-.170
Academic Advisor	.231	.581	-.198	-.374	.006
Teachers	-.009	.412	-.214	-.477	.300
Bilingual Collegiate Program	.165	.142	-.705	-.134	.081
Ahora Organization	.397	-.009	-.524	-.096	-.043
Legal Services	.869	.109	-.107	-.234	.135
Psychological Services at Tobin Hall	.943	.048	-.089	-.073	.167
University Health Center	.692	.005	-.145	-.170	.503

Table 12  
(Continued)

Data	Rotated Factor Loadings				
	1	2	3	4	5
<u>Social Support (continued)</u>					
University Mental Health Center	.648	.246	.424	-.212	.054
Other University Agencies	.052	.195	-.288	.034	.385
Welfare Office	.176	.062	.012	-.600	.340
Veterans Administration Office	.458	-.097	.005	-.613	.070
Other Off-Campus Agencies	.396	.175	-.127	-.094	.775

The identified factors in Table 11 are the following: Factor 1 is Direct Service Agencies Support in All Areas, Factor 2 is Academic Departments and Teachers Support in All Areas, Factor 3 is Bilingual Collegiate Program Support in All Areas, Factor 4 is Welfare and Veteran's Administration Material and Educational Support, and Factor 5 is University Health Center Support in All Areas.

Cultural Values. Data from this area were factor analyzed with a five-factor varimax rotation solution as is illustrated in Table 12.

Table 13

## Five-factor Varimax Rotation Solution for the Cultural Values Data

Data	Rotated Factor Loadings				
	1	2	3	4	5
<u>STUDENT VALUES</u>					
To attend class most of the time	.447	.011	.006	.032	.442
To obtain high scores on exams	.634	.114	-.219	.171	-.088
To participate in class	.303	.257	.262	-.011	.264
To be among the best in your class	.725	.074	-.005	.007	.010
To read books of general interest	.382	.018	.210	.108	.388
To participate in sports or gymnastics	-.017	.210	.391	-.109	.438
To complete assigned readings	.659	.080	.087	.218	.148
To graduate	.280	.190	-.044	.232	.204
To be awarded an academic honor	.574	-.196	-.135	.220	.145
To know the answers in class	.673	-.002	.099	.142	.196
To get good grades	.737	.121	.127	.234	-.032
To pass grade	.533	.107	.044	.037	.049
To know about things in general	.247	.169	.286	-.020	.258
To have a high grade point average	.646	.125	-.024	.342	-.006
To be elected class president	.626	.139	.304	-.143	.240
To get a scholarship	.689	-.032	.314	.192	.103
To better your standard of living	.496	.059	.016	.055	.092
To be admitted to graduate school	.365	.049	.190	.031	.540
To be better prepared than the opposite sex	.729	-.020	-.016	-.061	.098
To graduate to help your community	.122	-.131	.028	.068	.630
To be a good student to conform with God	.314	.238	.189	.039	.515

Table 13  
(Continued)

Five-factor Varimax Rotation Solution for the Cultural Values Data		Rotated Factor Loadings				
Data		1	2	3	4	5
<u>MOTHERS VALUES</u>						
That student	attend class most of the time	-.030	.112	.460	.858	.051
"	participate in class	.177	.083	.334	.592	.041
"	prepare well for exams	.029	.147	.187	.888	.130
"	complete assignments	.032	.175	.128	.905	.105
"	read books of general interest	.094	.078	.144	.709	.082
"	participate in sports or gym	.066	.161	.425	.143	.301
"	graduate	.083	.049	.119	.745	.191
"	obtain an academic honor	.386	-.301	.353	.359	-.292
"	obtain good grades	.275	.086	.218	.637	-.202
"	pass grade	.126	.027	.217	.639	-.152
"	know about things in general	.191	.190	.171	.608	.200
"	have a high grade point average	.302	-.048	.347	.599	-.220
"	better its standard of living	.380	.048	-.017	.599	-.006
"	help them to raise theirs	.513	-.338	-.065	-.065	.142
"	be admitted to graduate school	.394	-.195	.304	.237	.422
"	become famous someday	.614	-.124	.219	.026	.127
"	graduate to help their community	.214	-.190	.165	.311	.405
To carry God's mandate that parents are responsible for their children		.253	-.103	.322	.342	.517

Table 13  
(Continued)

## Five-factor Varimax Rotation Solution for the Cultural Values Data

Data	Rotated Factor Loadings				
	1	2	3	4	5
<u>FATHERS VALUES</u>					
That student attend class most of the time	-.260	.182	.753	.339	.002
" " participate in class	.056	.168	.783	.233	.052
" " prepare well for exams	-.122	.214	.768	.413	.093
" " complete assignments	-.147	.254	.741	.411	.080
" " read books of general interest	.003	.217	.751	.319	.055
" " participate in sports or gym	.095	.241	.641	.078	.185
" " graduate	-.188	.107	.733	.209	.112
" " obtain academic honors	.212	.173	.777	.043	-.203
" " obtain good grades	.000	.110	.829	.138	-.064
" " pass grade	-.039	.053	.764	.164	-.148
" " know about things in general	.042	.290	.780	.201	.186
" " have a high grade point average	.103	-.049	.880	.216	-.084
" " better its standard of living	.138	.183	.704	.087	-.078
" " help them to raise theirs	.444	-.266	.469	-.216	.069
" " be admitted to graduate school	.272	.033	.732	.052	.301
" " become famous someday	.493	-.125	.604	-.074	.104
" " graduate to help their community	.019	-.074	.703	-.033	.292
To carry God's mandate that parents are responsible for their children	.142	-.111	.519	.074	.525



The factors identified in Table 13 were labeled as follows: Factor 1: Student Values in General, Factor 2: Student and Parental Values in General, Factor 3: Fathers Values in General, Factor 4: Mothers Values in General, and Factor 5: Student and Parental Values Regarding School, the Community, and God.

### Multiple Regression Analyses

To test the value contributed by each of the variables to the variance in academic functioning, multiple regression solutions were computed for the systems in the EcoModel. As a first step, multiple regression analyses were computed separately for the personal and systems levels of the model. The second step was to compute a multiple regression solution that included all the variables combined, from both personal and systemic levels in a hierarchical regression.

#### Multiple Regression Analysis of Personal Variables

The variables entered in the regression equation were intelligence, self-esteem, personality traits, cultural background, locus of control, study habits, quality of high school education, and material resources. Table 14 presents the regression results for the dependent variable grade point average (GPA) as predicted by personal variables.

None of the eight personal variables entered in the regression equation were found to be statistically significant at the .05 level of probability, in predicting GPA. Together, all the variables from the personal level of the EcoModel accounted for .069% of the variance in academic functioning, while the variable self-esteem alone accounted for .033% of the variance. The stepwise hierarchy indicated that self-esteem, personality traits,

material resources, and cultural background together accounted for .063% of the variance observed, while the remaining four factors of intelligence, locus of control, study habits, and quality of high school education accounted for only .006% of it.

(Place Table 14 approximately here)

Table 15 presents the regression results for the dependent variable GPA as predicted by systemic variables. Two of the systemic variables entered in the regression equation had  $p$  values that were statistically significant at the .05 level of probability. Together all the variables from the systemic level of the EcoModel account for .142% of the variance in academic functioning. The support that agencies give to the student (i.e.: exosystemic support) combined with the support given by the student's immediate family (i.e.: microsystemic support) accounted for .127% of the total variance in GPA.

(Place Table 15 approximately here)

The solution that was computed for the combined personal and systemic variables resulted in a statistically different picture. Together all the variables entered accounted for .218% of the total variance in GPA. Only the first three variables entered showed statistically significant probability values. Together these three variables accounted .158% of the variance in academic functioning.

Table 14  
 Stepwise Regression Results for the Dependent Variable GPA as Predicted by  
 Personal Variables

Prediction	Step	Predictor Entered	r	R <sup>2</sup>	Increase in R <sup>2</sup>	F at final step	P value
GPA by	1	Self-esteem	-.166	.027	.027	1.38	.246
Personal	2	Personality Traits	-.064	.042	.015	1.05	.358
Variables	3	Material Resources	-.133	.056	.014	.93	.432
	4	Cultural Background	-.115	.064	.007	.78	.500
	5	Intelligence	-.019	.067	.003	.64	.500
	6	Locus of Control	-.051	.68	.001	.53	.500
	7	Study Habits	-.006	.069	.001	.46	.500
	8	Quality of High School	.017	.070	.001	.39	.500

P value statistically significant at  $p < .05$  level.

Table 15  
 Stepwise Regression Results for the Dependent Variable GPA as Predicted  
 by Systemic Variables

Prediction	Step	Predictor Entered	r	R <sup>2</sup>	Increase in R <sup>2</sup>	F at final step	P value
GPA by Systemic Variables	1	Exosystem Support	-.288	.083		4.444	.041*
	2	Microsystem Support	.216	.127	.044	3.49	.039*
	3	Macrosystem Support	.174	.137	.010	2.49	.072
	4	Mesosystem Support	.121	.142	.005	1.90	.127

\*statistically significant at  $p < .05$  level.

Table 16  
 Stepwise Regression Results for the Dependent Variable GPA as Predicted  
 by Personal and Systemic Variables

Prediction Step	Predictor Entered	r	R <sup>2</sup>	Increase in R <sup>2</sup>	F at final step	P value
GPA by						
Personal	Exosystem Support	-.288	.083	.083	4.44	.041*
and	Microsystem Support	.216	.127	.044	3.49	.039*
Systemic	Self-esteem	-.166	.158	.031	2.93	.044*
Variables	Mesosystem Support	.121	.175	.017	2.43	.061
	Personality Traits	-.074	.183	.008	2.01	.095
	Material Resources	-.133	.191	.008	1.73	.137
	Macrosystem Support	.174	.200	.009	1.53	.182
	Cultural Background	-.115	.207	.007	1.37	.239
	Intelligence	-.019	.212	.006	1.23	.306
	Study Habits	-.006	.216	.004	1.10	.386
	Quality of High School	.017	.216	.001	.98	.482
	Locus of Control	-.051	.216	.000	.87	.500

P value statistically significant at the  $p < .05$  level.

In interpreting Tables 15 and 16 it is imperative that the direction of the influence of the exosystem support variable on GPA be properly understood. That is, exosystemic support is negatively correlated to GPA (correlation coefficient  $-0.288$ ) which means that the lower the student's GPA the greater the degree of support required from the exosystemic level. This is to say that although the exosystem is the most influential system in the ecology, it becomes less and less relevant or influential as students' GPA improves.

## C H A P T E R V

### CONCLUSIONS AND RECOMMENDATIONS

Having described in detail the major findings in the study, the present chapter attempts to:

1. derive the most important conclusions about the personal and ecological variables that influence the academic functioning of this Puerto Rican sample
2. formulate the most important implications for the practice of counseling psychology
3. offer the most important recommendations which are deemed necessary for the continued improvement of the personal and academic functioning of Puerto Rican college students at this University.

## CONCLUSIONS

In this section of the chapter I have attempted to answer the main research questions in the study by deriving three sets of conclusions, each of which addressed a different area of inquiry.

### Answer to Research Question 1:

What personal factors contribute to the effective academic functioning of Puerto Rican college students?

None of the personal variables studied had statistically significant probability values, except for the variable self-esteem which showed a statistically significant P value at the .05 level, once entered in the final multiple regression equation with the combined personal and systemic variables. These statistical results suggest that the measures of personal variables may not have been valid enough or that the measures excluded variables that were important.

Students reported grade point averages that place them in very good academic standing as a group. This finding lends validity to the study since the aim was to look at the functioning of academically effective students. However, it also points to a sample bias in the study, which may have contributed to the lack of statistical significance among the personal variables studied.

### Answer to Research Question 2:

What social systems support effective academic functioning among Puerto Rican college students?

Only the exosystem and the microsystem showed statistically significant probability values, which



suggests that agencies and the immediate family were the most important sources of support to the students in the sample.

Agencies appeared to be more helpful to students than the immediate family, which may in part be a function of the increased accessibility of agencies to students on the University campus. Nevertheless, the student's immediate family network is a very important source of support. Together, agencies and the immediate family network can provide most of the support that the student needs in college.

However, as was specified in chapter four, agency support is negatively correlated to effective academic functioning. This is to say that the less effective the student is, the more support he or she requires from agencies. Highly effective students require very little support from the exosystem.

Within the exosystem, the Bilingual Collegiate Program (BCP) was the single most helpful agency to students on this campus. Within the microsystem, mothers were the single most helpful member of the immediate family. These findings raise the implication that agencies in general, and the BCP in particular should continue their availability and support to Puerto Rican students, and should look for ways to enhance it. This may be attempted by forming an educational alliance with the families of Puerto Rican students on campus.

It may be further concluded in answer to question number two, that the supportive capacity of agencies and the immediate family networks is sustained by positive self and parental values regarding academic achievement which are couched in the culture and tradition of the Puerto Rican people.

Answer to Research Question 3:

What coping strategies sustain effective academic functioning among Puerto Rican college students?

In order to answer this question, it must be stated that the human-need stresses that most affected the students in the sample were income, employment, education and recreation needs, followed by daily living, housing, and transportation needs, in that order.

The academic-system stresses that most affected the students in the sample were: term papers, final exams, written and research assignments, exams in general, course load, fees and tuition, the weather, and institutional rules and regulations, in that order.

Strategy number 5, which places heavy reliance on agencies and other groups in the exosystem, was the most widely used strategy, especially by those students with a low grade point average. Academically effective students also use the exosystem for support, but they require less of it.

The students use the resources of agencies and the immediate family first, in dealing with their human-need and academic-system stresses. If the stresses were to persist the students would then make use of their own resources, the resources of Puerto Rican friends and college roommates. These strategies are couched and supported by the values of the Puerto Rican culture regarding academic achievement.

IMPLICATIONS FOR THE PRACTICE  
OF COUNSELING PSYCHOLOGY

In this section I have attempted to integrate the concepts and principles from the ecosystemic literature discussed chapter 2 with the findings from this study, into broad, general implications for the development of an ecological perspective in counseling.

As a matter of definition I have conceptualized ecologically-oriented counseling as the process of helping individuals understand the ecology of human functioning. This definition is progressively elaborated upon as I outline the major implications for counseling and ecological interventions. However, a full exploration and discussion of each of the implications listed is not within the scope of this section.

Implication 1. Ecologically-oriented counseling is based on the assumption that behavior is influenced both from within and without the person, through a complex process of ecological adaptation.

Implication 2. Counseling must allow for reciprocal processes between the person and its social network(s) to be examined in the helping relationship.

Implication 3. Counseling requires recognition of interactors in the counselee's social network(s), not excluding the counselor.

Implication 4. The ecologically-oriented counselor needs to map out the particular social networks with which the counselee has significant interaction.

Implication 5. Ecological counseling requires the assessment of supportive interaction within and between the counselee's social networks.

Implication 6. In assessing interactions within social networks, the counselor needs to determine the sources of support that the counselee has available within its network.

Implication 7. In assessing interactions between social networks, the counselor needs to identify networks in conflict, that is, networks that impose differing and opposing rules or demands upon the counselee.

Implication 8. Ecologically-oriented counseling attempts to utilize and/or mobilize the natural helping capability of the counselee's social networks.

Implication 9. Ecological counseling redefines goals, roles, and activities to provide for supportive interconnections between networks previously isolated from each other.

Implication 10. Ecological counseling leads to increased understanding of social networks, and to more efficient utilization of the resources of the network by the counselee.

Implication 11. Ecological counseling may include a radical exploration and restructuring of the social network that activates previously unrealized potentials in both the counselee and the network.

Implication 12. Ecological counseling is enhanced when carried out in naturalistic settings and involves objects and activities from everyday life.

## RECOMMENDATIONS

In this last section of the chapter, I have discussed the most relevant recommendations that stemmed from the study. These were organized in two general areas: recommendations for public policy and for research.

### Recommendations for Public Policy

#### 1. Admissios Criteria

Traditional admissions policies at this University need to take into account important criteria which demonstrated to have considerable influence on the academic functioning of this Puerto Rican student sample.

It must be kept in mind that a very large majority of the parents in the study have a High School level diploma or higher degree, and hold professional occupations. Admission officers need to recruit more students from family networks of lower socio-economic status, so that a broader spectrum of the Puerto Rican community in this region may benefit from the educational services provided at the University of Massachusetts.

#### 2. Services to the Community

The immediate family is a network of extraordinary support to the students, and immediate family members should be invited to campus by concerned agencies, for two main purposes:

- a. to educate them about the stresses of student life
- b. to enhance their natural support skills through parental and community training workshops

#### 3. Services to Students

Since 86% of the sample was in good or very good academic standing, support services to students should not focus only on low achievers through tutorial and remedial

programs. Findings indicated that services should include preventive and enrichment programs to reach out to those students who are achieving well and who may benefit from extracurricular services. For instance, prevention or enrichment may be accomplished through a series of skills development workshops that focus on the acquisition of effective study habits, network-building and network-utilization skills, to mention just a few. In addition, students should be trained and encouraged to develop peer-support networks in their dormitories and in other campus and off-campus settings.

### Recommendations for Research

#### 1. Conceptual Model

Methodologically, the EcoModel demonstrated its usefulness in covering a large number of independent effects. It represents a radical shift in paradigm from the traditional models that hold the individual student solely responsible for his or her level of academic functioning. In view of this, The EcoModel should be used in other settings and with other populations to test its cross-cultural applicability.

In addition, the usefulness of the EcoModel for direct clinical and counseling interventions should be explored.

#### 2. The Sample

This study generated data on Puerto Rican college students, who comprise a sizeable portion of the United States population. Although findings may be generalized to other bilingual-Hispanic populations in the northeastern part of the United States, it is recommended that further study be carried out with a more heterogeneous population in terms of academic effectiveness (i.e. high and low achievers) and ethnic background (i.e.: Anglo, Indian, or Black Americans).

### 3. Instrumentation

It is recommended that replication of the study be modified in terms of the measures of personal variables to increase their validity and statistical significance.

### 4. Statistical Analysis

Further analysis of the data should be carried out especially more correlational analysis and more contrasting should be done between elements in the sample in terms of sex, age, GPA, and socio-economic status.

Further stepwise regression analysis should be done on each of the social systems in the EcoModel to look at the intra-familial and inter-systemic aspects of social support.

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APPENDIX

INSTRUMENTATION

Page

I. Instruments for the assessment of personal variables

A. Psychological Resources

Intelligence

1. Wechsler Adult Intelligence Scale (WAIS)  
Vocabulary Subtest .....
2. Self-report of intellectual ability .....

Self-Esteem

3. Self-esteem scale .....

Independence, Persistence, Ambition

4. Personality-traits self-rating scale .....

Cultural Background

5. Cultural background questionnaire .....

Locus of Control

6. Intellectual achievement responsibility  
questionnaire .....

B. Skills and Competence

Command of English

7. Michigan Test of English Language  
Proficiency .....

Study Habits

8. Study habits questionnaire .....

Quality of high school education

9. Quality of high school education questionnaire ..

C. Material Resources

10. Material Resources Checklist .....

II. Instruments for the assessment of systemic variablesSupport Systems

11. Support-System Networks Questionnaire .....

12. Cultural Values regarding academic achievement .....

III. Instruments for the assessment of process variablesStresses

13. Human-Needs Stress Index .....

14. Academic Setting Stress Index .....



I. Instrument for the Assessment of Personal Factors

Intelligence

Scale Name: Wechsler Adult Intelligence Scale  
Vocabulary Sub-Test

Author: David Wchsler

Copyright: The Psychological Corporation

Variable: The vocabulary sub-test measures verbal reasoning and intellectual ability

Description: Vocabulary is generally considered the best single measure of general intelligence. The vocabulary subtest is composed of 40 words to be defined, listed in estimated order of difficulty. The three-level scoring system is as follows: 2 points for sufficiently abstract and accurate responses, and 1 point for descriptive, concrete, functional, or vague responses. Inferior synonyms or inexact definitions are given no point. (Taken from Zimmerman and Woo-Sam, 1973, pp. 107-108.)

Basic Reference: Zimmerman, Irla L. and James Woo-Sam  
Clinical Interpretation of the Wechsler  
Adult Intelligence Scale. New York:  
Grune and Stratton, Incorporated, 1973.

Scale Name: Self-Report of Intellectual Ability

Authors: Developed for this study

Description: This measure consists of two questions  
which aim to compare measured intelligence  
(WAIS) with students' own perceptions of  
their intellectual ability:

1. How would you rate your intelligence:

- \_\_\_\_\_ (1) Very superior
- \_\_\_\_\_ (2) Superior
- \_\_\_\_\_ (3) Above average
- \_\_\_\_\_ (4) Below Average
- \_\_\_\_\_ (5) Deficient
- \_\_\_\_\_ (6) Very deficient

2. How many awards or prizes have you obtained during  
your academic life?

- \_\_\_\_\_ (1) None
- \_\_\_\_\_ (2) One
- \_\_\_\_\_ (3) Two

\_\_\_ (4) Three

\_\_\_ (5) Four or more

Self Esteem

Scale Name: Self-Esteem Scale

Author: M. Rosenberg

Copyright: None

Variable: The scale measures self-attitudes along a favorable-to-unfavorable dimension.

Description: High self-esteem as defined by the author means that the individual respects himself, considers himself worthy, does not consider himself worthy, does not consider himself better or worse than others, recognizes his limitations, and expects to grow and improve. The test is composed of ten items requiring one of four answers: strongly agree, agree, disagree, and strongly disagree. Positively and negatively worded items are presented alternately to reduce the possibility of response set. (Taken from J. Robinson and P. Shaver, Measures of Social Psychological Attitudes, pp. 98-99.)

Basic References: Rosenberg, M. Society and the Adolescent Self-image. Princeton, New Jersey: Princeton University Press, 1965.

SELF-ESTEEM SCALE (Rosenberg, 1965)

Please answer the following statements according to whether you strongly agree, agree, disagree, or strongly disagree. Make a check mark (✓) next to that alternative which best reflects your feelings

1. On the whole, I am satisfied with myself,

- strongly agree
- agree
- disagree
- strongly disagree

2. At times I think I am no good at all,

- strongly agree
- agree
- disagree
- strongly disagree

3. I feel that I have a number of good qualities,

- strongly agree
- agree
- disagree
- strongly disagree

4. I am able to do things as well as most other people,

\_\_\_ strongly agree

\_\_\_ agree

\_\_\_ disagree

\_\_\_ strongly disagree

5. I feel I do not have much to be proud of,

\_\_\_ strongly agree

\_\_\_ agree

\_\_\_ disagree

\_\_\_ strongly disagree

6. I certainly feel useless at times,

\_\_\_ strongly agree

\_\_\_ agree

\_\_\_ disagree

\_\_\_ strongly disagree

7. I feel that I am a person of worth, at least on an  
equal plane with others.

\_\_\_ strongly agree

\_\_\_ agree

\_\_\_ disagree

\_\_\_ strongly disagree

8. I wish I could have more respect for myself,

\_\_\_ strongly agree

\_\_\_ agree

Self-Esteem Scale

\_\_\_ disagree

\_\_\_ strongly disagree

10. I take a positive attitude toward myself,

\_\_\_ strongly agree

\_\_\_ agree

\_\_\_ disagree

\_\_\_ strongly disagree

Independence, Persistence, Ambition

Scale Name: Personality-traits Self-rating Scale

Author: Developed for this study.

Variables: The instrument measures individual's self-rating of personal independence, persistence, and ambition in regards to academic life.

Description: The scale is arranged as follows: subjects are asked to compare themselves with other students with whom they went to school, using this rating scale:

5 - more than the majority

4 - a little more than the majority

3 - same as the majority

2 - less than the majority

1 - a lot less than the majority

---

5    4    3    2    1

---

Independence

---

Persistence

---

Ambition

---

Basic Reference: Nuttall, R. L. and Ena V. Nuttall -  
The Center for Population Research

Scale Name: Cultural Background Questionnaire

Author: Developed for this study

Copyright: None

Variable: The instrument measures students' ethnic and cultural backgrounds

Description: The questionnaire is composed of 14 items which cover grandparents, and students' places of birth, time spent in this country, language(s) spoken, and cultural affiliation.



Cultural Background Questionnaire

1. Were your grandparents born in Puerto Rico?

Maternal Grandmother                           YES           NO

Maternal Grandfather                          YES           NO

Paternal Grandmother                          YES           NO

Paternal Grandfather                          YES           NO

2. Was your mother born in Puerto Rico?

       YES

       NO

3. If your answer is no, where was your mother born?

\_\_\_\_\_

4. Was your father born in Puerto Rico?

       YES

       NO

5. If your answer is no, where was your father born?

\_\_\_\_\_

6. Were you born in Puerto Rico?

       YES

       NO

7. If your answer is no, where were you born?

\_\_\_\_\_

8. If your answer is yes, how long have you been in the United States?

       Less than one year

       One to two years

- Two to five years
- Five to ten years
- Ten to fifteen years
- More than fifteen years

9. Where did you grow up?

- Puerto Rico
- United States
- Other, please specify \_\_\_\_\_

10. What language(s) do you speak?

- Mostly English
- Both English and Spanish, but prefer English
- Both English and Spanish, but prefer Spanish
- Mostly Spanish

11. What do you consider yourself to be?

- Puerto Rican
- Predominantly Puerto Rican, somewhat American
- Both Puerto Rican and American
- Predominantly American, somewhat Puerto Rican
- American

12. What are your parents' occupation? Please state job title or describe the type of work.

Mother \_\_\_\_\_

Father \_\_\_\_\_

13. What is the highest level of education your parents attained?

Mother \_\_\_\_\_

Father \_\_\_\_\_

Educational Level

- Elementary School
- High School
- Associate Degree
- Bachelor's Degree
- Master's Degree
- Doctoral Degree

14. Please rate your parents' command of the English language in the following areas, using the key provided:

Rating Key

- 0 Not Applicable or Don't Know
- 1 Poor
- 2 Fair
- 3 Good
- 4 Excellent

Command of English

Rating

	<u>Mother</u>	<u>Father</u>
Speaking	_____	_____
Reading	_____	_____
Writing	_____	_____

Locus of Control

Scale Name: Intellectual Achievement Responsibility Questionnaire

Authors: Crandall, Katkovsky, and Crandall

Copyright: None

Variable: The scale measures internal vs. external control orientation.

Description: The IAR questionnaire measures the child's beliefs on whether he is responsible for his progress or whether external factors beyond his control affect his progress. The scale is composed of thirty-four forced-choice items. Each item describes either a positive or negative achievement experience that routinely occurs in children's lives. This item is followed by one alternative stating that the event was caused by the child and another stating that the event occurred because of the behavior of someone else in the child's immediate environment. A child's 1+ score is obtained by summing all positive events for which he assumes credit, and his 1- score is a total of all negative events for which he

assumes blame. (Taken from O. G. Johnson and J. W. Bommarito, Tests and Measurements in Child Development: A Handbook, pp. 299-300.)

Basic References: Crandall, Virginia C., Katkovsky, W. and Crandall, V. J. "Children's Beliefs in Their Own Control of Reinforcements in Intellectual-Academic Achievement Situations," Child Development, 1965, pp. 36, 91-109

Intellectual Achievement Responsibility Questionnaire

1. If a teacher passes you to the next grade, would it probably be
  - a. because she liked you, or
  - b. because of the work you did?
2. When you do well on a test at school, is it more likely to be
  - a. because you studied for it, or
  - b. because the test was especially easy?
3. When you have trouble understanding something in school, is it usually
  - a. because the teacher didn't explain it clearly
  - b. because you didn't listen carefully?
4. When you read a story and can't remember much of it, is it usually
  - a. because the story wasn't well written, or
  - b. because you weren't interested in the story?
5. Suppose your parents say you are doing well in school. Is this likely to happen
  - a. because your school work is good, or
  - b. because they are in a good mood?
6. Suppose you did better than usual in a subject at school. Would it probably happen
  - a. because you tried harder, or
  - b. because someone helped you?

IARQ

7. When you lose at a game of cards or checkers, does it usually happen
  - a. because the other player is good at the game, or
  - b. because you don't play well?
8. Suppose a person doesn't think you are very bright or clever.
  - a. Can you make him change his mind if you try to, or
  - b. Are there some people who will think you're not bright no matter what you do?
9. If you solve a puzzle quickly, is it
  - a. because it wasn't a very hard puzzle, or
  - b. because you worked on it carefully?
10. If a boy or girl tells you that you are dumb, is it more likely that they say that
  - a. because they are mad at you, or
  - b. because what you did really wasn't very bright?
11. Suppose you study to become a teacher, scientist, or doctor, and you fail. Do you think this would happen
  - a. because you didn't work hard enough, or
  - b. because you needed some help, and other people didn't give it to you?

IARQ

12. When you learn something quickly in school, is it usually
- a. because you paid close attention, or
  - b. because the teacher explained it clearly?
13. If a teacher says to you, "Your work is fine," is it
- a. something teachers usually say to encourage pupils, or
  - b. because you did a good job?
14. When you find it hard to work arithmetic or math problems at school, is it
- a. because you didn't study well enough before you tried them, or
  - b. because the teacher gave you problems that were too hard?
15. When you forget something you heard in class, is it
- a. because the teacher didn't explain it very well, or
  - b. because you didn't try very hard to remember?
16. Suppose you weren't too sure about the answer to a question the teacher asked you, but your answer turned out to be right. Is it
- a. because she wasn't as particular as usual, or
  - b. because you gave the best answer you could think of?



IARQ

17. When you read a story and remember most of it, is it usually
- a. because you were interested in the story, or
  - b. because the story was well written?
18. If your parents tell you you're acting silly and not thinking clearly, is it more likely to be
- a. because of something you did, or
  - b. because they happen to feel cranky?
19. When you don't do well on a test at school is it
- a. because the test was especially hard, or
  - b. because you didn't study for it?
20. When you win at a game of cards or checkers, does it happen
- a. because you play really well, or
  - b. because the other person doesn't play well?
21. If people think you're bright or clever, is it
- a. because they happen to like you, or
  - b. because you usually act that way?
22. If a teacher didn't pass you to the next grade, would it probably be
- a. because she "had it in for you," or
  - b. because your school work wasn't good enough?

IARQ

23. Suppose you don't do as well as usual in a subject at school. Would this probably happen
- a. because you weren't as careful as usual, or
  - b. because somebody bothered you and kept you from working?
24. If a boy or girl tells you that you are bright, is it usually
- a. because you thought up a good idea, or
  - b. because they like you?
25. Suppose you become a famous teacher, scientist or doctor. Do you think this would happen
- a. because other people helped you when you needed it or
  - b. because you worked very hard?
26. Suppose your parents say you aren't doing well in your school work. Is this likely to happen more
- a. because your work isn't very good, or
  - b. because they are feeling cranky?
27. Suppose you are showing a friend how to play a game and he has trouble with it. Would that happen
- a. because he wasn't able to understand how to play, or
  - b. because you couldn't explain it well?

28. When you find it easy to work arithmetic or math problems at school, is it
- a. because the teacher gave you especially easy problems, or
  - b. because you studied your book well before you tried them?
29. When you remember something you heard in class, is it usually
- a. because you tried hard to remember, or
  - b. because the teacher explained it well?
30. If you can't work a puzzle, is it more likely to happen
- a. because you are not especially good at working puzzles, or
  - b. because the instructions weren't written clearly enough?
31. If your parents tell you that you are bright or clever, is it more likely
- a. because they are feeling good, or
  - b. because of something you did?
32. Suppose you are explaining how to play a game to a friend and he learns quickly. Would that happen more often
- a. because you explained it well, or
  - b. because he was able to understand it?

IARQ

33. Suppose you're not sure about the answer to a question your teacher asks you and the answer you give turns out to be wrong. Is it likely to happen
- a. because she was more particular than usual,
  - or
  - b. because you answered too quickly?
34. If a teacher says to you, "Try to do better," would it be
- a. because this is something she might say to get pupils to try harder, or
  - b. because your work wasn't as good as usual?

Command of English

- Scale Name: Michigan Test of English Language  
Proficiency - Form A
- Author: English Language Institute, University  
of Michigan
- Copyright: English Language Institute, 1962
- Variables: The instrument measure the following  
aspects of English language proficiency:  
grammatical usage, vocabulary, and com-  
prehension.
- Description: The MTELP-Form A was designed as part of a  
battery to estimate whether a student  
whose native language is not English is  
able to pursue academic study in an  
English language college or university, and  
how much study he might be able to under-  
take at his present level of proficiency  
in English. The Michigan Test is a 100-  
item objectively scored test of English  
grammatical usage, vocabulary, and reading  
comprehension. Total administration time is  
1 1/2 hours, 75 minutes of which is allowed  
to the student for taking the examination,

the remainder for instructions by the  
examiner, etcetera.

Basic Reference: English Language Institute. Michigan  
Test of English Language Proficiency -  
Form A Manual, Section I, p. 22, 1962.

Study Habits

- Scale Name: Study Habits Questionnaire
- Authors: Ralph C. Preston and Morton Botel  
Translated to Spanish by Hilda A. Juarbe, of the University of Puerto Rico at Rio Piedras.
- Copyright: Science Research Associates  
Chicago, Illinois - 1956
- Variable: Measures study habits at college level
- Description: This will be a brief form of the Study Habits Questionnaire, to include nineteen items from the original list of thirty two. Only the most relevant items have been retained. The instrument was originally developed for use with college students, and has been translated into Spanish.
- Basic Reference: Preston, Ralph C. and Morton Botel  
How to Study, Chicago, Illinois:  
Science Research Associates, 1956, pp.  
7-10.

Study Habits Questionnaire

Questions	Almost always	Most of the time	Half of the time	Less than half of the time	Almost never
<u>Use of Time</u>					
1. Do you keep your assignments on time?					
2. Do you write down how you will distribute your study time?					
3. Do you distribute your study time among the various course you are taking?					
<u>Physical Setting</u>					
4. Do you have enough space on a desk or study table?					
5. Do you study in a quiet place, free from noise and interruptions?					
6. Do you prefer to study alone than with others?					
7. Before sitting at your desk do you look for materials or equipment you may need?					



Study Habits Questionnaire

Questions	Almost always	Most of the time	Half of the time	Less than half of the time	Almost never
<u>Reviewing</u>					
8. Do you look through the chapter before starting to read?					
9. Do you use headings, subtitles, illustrations, and italicized words?					
<u>Reading</u>					
10. When doing assigned readings, do you keep questions in mind that you will try to answer as you read?					
11. Can you find the primary idea of what you read?					
12. Do you try to find the meaning of important new words?					
<u>Taking Notes</u>					
13. Do you take notes as you read?					

Study Habits Questionnaire

Questions	Almost always	Most of the time	Half of the time	Less than half of the time	Almost never
14. Do you review your class notes as soon as possible?					
<u>Recall</u> 15. Do you try to understand all the material you must remember?					
16. When you try to memorize material, do you try to summarize it in your own words?					
17. Do you try to relate what you learn in one course with what you learn in another?					
<u>Taking Exams</u> 18. Do you prepare well for exams?					
19. When you study for an exam, do you combine notes from the text with notes from the class in a single outline?					

Quality of High School Education

- Scale Name: Quality of High School Education Questionnaire
- Author: Developed for this study.
- Variables: The instrument measures various aspects of the educational experience subjects had during high school.
- Description: The questionnaire includes 19 items covering academic program, school size, area, and other general information. In addition, there is a 5-item semantic-differential scale covering general, bilingual, individualized: tutorial and corrective, and enrichment aspects of the curriculum.
- Basic References: Maguier, Thomas O. "Semantic Differential Methodology for the Structuring of Attitudes," American Educational Research Journal, Fall 1976, 10, 4, 295-306.

Quality of High School Education Questionnaire

1. Where did you spend most of your high school years?

Puerto Rico

United States

Other, please specify \_\_\_\_\_

2. Where did you graduate from high school?

Puerto Rico

United States

Other, please specify \_\_\_\_\_

3. What kind of school did you attend?

Private Non-religious

Private Religious

Public

4. What kind of program were you enrolled in?

General Academic

Commercial

Technical

Vocational

General Equivalency Diploma (GED)

Don't Know

Not Applicable; please explain \_\_\_\_\_

5. Where was the school located?

Urban Area

Inner City

Quality of High School Education Questionnaire

Suburb

Rural Area

Not Applicable

6. Was the school?

Very Large (over 2,000 students)

Large (between 1,000 and 1,999 students)

Medium (between 500 and 999)

Small (less than 500)

Don't Know

Not Applicable

7. Did the school offer bilingual instruction?

Yes

No

Don't Know

Not Applicable

8. If you answer yes, were you enrolled in the program of bilingual instruction?

Yes

No

Not Applicable

9. What was your final grade point average in high school?  
Between:

3.5 and 4.0

3.0 and 3.49

2.5 and 2.99

Quality of High School Education Questionnaire

\_\_\_\_\_ 2.0 and 2.49

\_\_\_\_\_ 1.5 and 1.99

\_\_\_\_\_ Don't Know

\_\_\_\_\_ Not Applicable

The purpose of the following items is to find out how you feel about certain things that are connected with your high school experience. You are asked to indicate how important and enjoyable to you was each of these things.

In general, how would you rate your high school experience?

Circle the word that best describes your feelings:

Instruction in general

	1	2	3	4	5
10.	very unimportant	unimportant	no feeling	important	very unimportant

	1	2	3	4	5
11.	very enjoyable	enjoyable	no feeling	important	very unimportant

Bilingual Instruction

	1	2	3	4	5
12.	very unimportant	unimportant	no feeling	important	very unimportant
13.	very enjoyable	enjoyable	no feeling	important	very unimportant

Individualized Tutorial Instruction

	1	2	3	4	5
14.	very unimportant	unimportant	no feeling	important	very important
15.	very enjoyable	enjoyable	no feeling	unenjoyable	very unenjoyable

Individualized Corrective Instruction

(remedial)

	1	2	3	4	5
16.	very unimportant	unimportant	no feeling	important	very important
17.	very enjoyable	enjoyable	no feeling	unenjoyable	very unenjoyable

Enrichment Program -  
Special Activities

	1	2	3	4	5
18.	very unimportant	unimportant	no feeling	important	very important
19.	very enjoyable	enjoyable	no feeling	unenjoyable	very unenjoyable

Income, Savings and Ownership

Scale Name: Material Resources Checklist

Author: Developed for this study.

Variable: This instrument measures students' material resources, and covers income, savings, and ownership of material objects relevant to college life.

Description: This is a three-item measure of material resources:

Please make a check mark (✓) next to those items which describe your sources of financial support in college. Mark as many as may be applicable.

1. Your main sources of income during college years:

Work (different from Work-Study)

Savings

Loan

Parents

Extended Family

Friends

Agencies:

University

Fellowship, Assistantship

Work-Study Program



- Loan
  - Social Security
  - Welfare Office
  - Veterans Administration
  - Other, please specify: \_\_\_\_\_
- 

2. Which of the following best describes your finances?

- (1) Barely able to make a living
- (2) Have the necessities
- (3) Comfortable
- (4) Well-to-Do

3. Which of the following do you own?

- automobile
- T.V. set
- radio
- telephone
- typewriter
- tape recorder
- phonograph
- calculator
- dictionary
- general educational and reference materials

Support Systems

- Scale Name: Support Systems Network Interview
- Author: Developed for this study.
- Variable: This is a measure of the various system that provide support to a particular individual under certain circumstances.
- Description: The interview includes three comprehensive items on immediate and extended family, and agencies' support to students in the following areas: materially, emotionally, educationally, and socially.

Support-Systems Network Questionnaire

Please answer the following questions, using the key provided to rate the amount of support you receive from different people. Just write the number, not the word, on the blank spaces under the appropriate column.

RATING KEY

- 1 - Detrimental
- 2 - Not Helpful
- 3 - Somewhat helpful
- 4 - Helpful
- 5 - Very helpful
- 6 - Extremely helpful
- 7 - Does not Apply (person is dead or never existed)

Support-Systems Network Questionnaire

1. HOW HELPFUL ARE THE FOLLOWING PEOPLE TO YOU IN THE AREAS DESCRIBED BELOW?

<u>MATERIALLY</u> (gives you money, pays your bills)	<u>EDUCATIONALLY</u> (helps with homework, termpapers)	<u>EMOTIONALLY</u> (supports or counsels you)	<u>SOCIALLY</u> (provides recreation or social activities)
---	---	--	---

Mother	_____	_____	_____
Father	_____	_____	_____
Sisters	_____	_____	_____
Brothers	_____	_____	_____
Other Family Members	_____	_____	_____
Friends:			
Puerto Rican	_____	_____	_____
American	_____	_____	_____
Other	_____	_____	_____
College Roomates:			
Puerto Rican	_____	_____	_____
American	_____	_____	_____
Other	_____	_____	_____

	<u>MATERIALLY</u>	<u>EDUCATIONALLY</u>	<u>EMOTIONALLY</u>	<u>SOCIALLY</u>
Psychological Services Center (at Tobin Hall)	_____	_____	_____	_____
University Mental Health Center (at Infirmary)	_____	_____	_____	_____
Other University Agencies (please specify)	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Welfare Office	_____	_____	_____	_____
Veterans Administration	_____	_____	_____	_____
Other off-campus Agencies (please specify)	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

2. HOW HELPFUL ARE THE FOLLOWING AGENCIES TO YOU IN THE AREAS DESCRIBED BELOW?

<u>MATERIALLY</u> (financial aid, medical bills, etc)	<u>EDUCATIONALLY</u> (tutorial, corrective, preventive, or special instruction)	<u>EMOTIONALLY</u> (guidance, counseling, psychotherapy)	<u>SOCIALLY</u> (recreation and social activities)
--	--	---	---

\_\_\_\_\_

University:

Financial Aid Office

Your major department

Your academic advisor

Your teachers

Bilingual Collegiate Program (BCP)

Bilingual Education Program (BBEPP)

AHORA Organization

Legal Services

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Cultural Values

Scale Name: Cultural Values Regarding Academic Achievement Scale

Author: Developed for this study

Copyright: None

Variable: The scale measures student values and student's perceptions of parental values.

Description: The scale was developed for this study, and measures two major areas: (1) student report of personal values: what he thinks is expected of him, his goals, and relative preferences for possible situations pertaining to academic achievement; (2) student report of parental values: student's perception of cultural mandates upon parents regarding student academic achievement, and parental goals.

Cultural Values Regarding Academic Achievement Scale - 1978

I - Student Report of Personal Values

Please indicate the degree to which each of the following situations is important to you, using the key provided below:

- 1 = Not important
- 2 = Slightly important
- 3 = Important
- 4 = Very important
- 5 = Extremely important

- \_\_\_ (1) To attend class most of the time
- \_\_\_ (2) To obtain high scores on tests and exams
- \_\_\_ (3) To participate in class discussion
- \_\_\_ (4) To be among the best students in your class
- \_\_\_ (5) To read books of general interest
- \_\_\_ (6) To participate in sports or gymnastic classes
- \_\_\_ (7) To complete assigned readings
- \_\_\_ (8) To graduate
- \_\_\_ (9) To be awarded an academic honor
- \_\_\_ (10) To know the answer when asked by the teacher
- \_\_\_ (11) To get good grades
- \_\_\_ (12) To pass grade
- \_\_\_ (13) To know a lot about things in general
- \_\_\_ (14) To keep a high grade point average
- \_\_\_ (15) To get a good job based on your education
- \_\_\_ (16) To be elected President of your class
- \_\_\_ (17) To get a scholarship based on your grade point average
- \_\_\_ (18) To better your standard of living by means of your education



Cultural Values Regarding Academic Achievement Scale -  
1978

I - Student Report of Personal Values (cont.)

- \_\_\_ (19) To be admitted to graduate school
- \_\_\_ (20) To be better prepared than the opposite sex
- \_\_\_ (21) To graduate in order to help your community
- \_\_\_ (22) To be a good student because God wants you to be.

## II - Student Report of Parental Values

Please indicate the degree to which each of the following situations is or was important to your parents, using the key provided. Please indicate such degree for both mother and father, in every item.

- 1 = Not important  
 2 = Slightly important  
 3 = Important  
 4 = Very important  
 5 = Extremely Important

MOTHER

FATHER

- |       |       |  |
|-------|-------|--|
| _____ | _____ | (23) That you attend class every day   |
| _____ | _____ | (24) That you participate in class   |
| _____ | _____ | (25) That you study for your exams   |
| _____ | _____ | (26) That you do your assignments  |
| _____ | _____ | (27) That you read books   |
| _____ | _____ | (28) That you participate in sports or<br>gymnastic activities                                 |
| _____ | _____ | (29) That you graduate   |
| _____ | _____ | (30) That you be awarded an academic honor   |
| _____ | _____ | (31) That you get good grades  |
| _____ | _____ | (32) That you pass grade   |
| _____ | _____ | (33) That you learn a lot about things   |
| _____ | _____ | (34) That you keep a high grade-point average  |
| _____ | _____ | (35) That you raise your standard of living<br>through education                               |
| _____ | _____ | (36) That you help them raise their standard<br>of living through your education               |
| _____ | _____ | (37) That you be admitted to graduate school   |
| _____ | _____ | (38) That you become famous some day   |
| _____ | _____ | (39) That you learn a lot to help your<br>community  |
| _____ | _____ | (40) To carry God's mandate that parents are<br>responsible for their children's be-<br>havior |

Stresses

Scale Name: Human Needs Stress Index

Author: Adapted from Nuttall, Nuttall, and  
Pedalino

Copyright: None

Variable: This measure will indicate the extent  
to which a series of factors are  
stressful for a given individual.

Description: Our approach has been to use a category  
system of human needs, and rate each  
factor on the extent to which it is  
a stress factor for a given individual.

Basic Reference: Nuttall, E. V., Nuttall, R. L., and  
M. Pedalino - The Ecology of Family  
Functioning of Low Income Groups  
(in press).

Human Needs Stress Index

<u>Stress Factor</u>	<u>Extent of Stress on Student</u>				
	<u>Minimal</u>	<u>Small</u>	<u>Some</u>	<u>Major</u>	<u>Very Large</u>
1. Food	_____	_____	_____	_____	_____
2. Clothing	_____	_____	_____	_____	_____
3. Furniture	_____	_____	_____	_____	_____
4. Housing	_____	_____	_____	_____	_____
5. Income	_____	_____	_____	_____	_____
6. Transportation	_____	_____	_____	_____	_____
7. Medical Needs	_____	_____	_____	_____	_____
8. Child Care	_____	_____	_____	_____	_____
9. Daily Living Needs	_____	_____	_____	_____	_____
10. Protection	_____	_____	_____	_____	_____
11. Employment	_____	_____	_____	_____	_____
12. Education	_____	_____	_____	_____	_____
13. Psychological Needs	_____	_____	_____	_____	_____
14. Recreation	_____	_____	_____	_____	_____
15. Legal Services	_____	_____	_____	_____	_____
16. Information Needs	_____	_____	_____	_____	_____

In this model the amount of stress on a student can be totaled across all the stress factors or specified particular types of stress.

Scale Name: Academic System Stress Factor

Author: Developed for this study

Variable: This measure will indicate the extent to which a series of factors are stressful for a given individual.

Description: We use a category system of stresses stemming from the social-academic environment, and rate each factor on the extent to which it is stressful for a given individual.

Academic System Stress Index

Stress Factor

Extent of Stress on Student

	<u>Not at all</u>	<u>Small</u>	<u>Some</u>	<u>Major</u>	<u>Very Large</u>
1. Weather	_____	_____	_____	_____	_____
2. Fees and Tuition	_____	_____	_____	_____	_____
3. Course Load	_____	_____	_____	_____	_____
4. Institutional Rules and Regulations	_____	_____	_____	_____	_____
5. Teacher's Sex	_____	_____	_____	_____	_____
6. Teacher's Race	_____	_____	_____	_____	_____
7. Dormmates	_____	_____	_____	_____	_____
8. Roommates	_____	_____	_____	_____	_____
9. Classmates	_____	_____	_____	_____	_____
10. Term Papers	_____	_____	_____	_____	_____
11. Written Assignments	_____	_____	_____	_____	_____
12. Reading Assignments	_____	_____	_____	_____	_____
13. Research Assignments	_____	_____	_____	_____	_____
14. Classroom Setting	_____	_____	_____	_____	_____
15. Classroom Language	_____	_____	_____	_____	_____
16. Textbook Language	_____	_____	_____	_____	_____
17. Examinations in general	_____	_____	_____	_____	_____
18. Final Exams	_____	_____	_____	_____	_____

Academic System Stress Index (cont.)

	<u>Extent of Stress on Student</u>				
	<u>Not at all</u>	<u>Small</u>	<u>Some</u>	<u>Major</u>	<u>Very Large</u>
19. Buildings	_____	_____	_____	_____	_____
Other stress factors, please specify:					
20. _____	_____	_____	_____	_____	_____
21 _____	_____	_____	_____	_____	_____





