A REVISION OF THE INSTITUTIONAL INTEGRATION MODEL:  
A REDEFINITION OF "PERSISTENCE" AND THE  
INTRODUCTION OF DEVELOPMENTAL VARIABLES

DISSERTATION

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By

Thomas N. Robinson, III, B.A., M.A.

* * * * *

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Dissertation Committee:  
Dorothy Jackson, Ph.D.  
Felicisima Serafica, Ph.D.  
William von Hippel, Ph.D.  
Philip Clark, Ph.D.

Approved by  
[Signature]

Adviser  
Department of Psychology
I honor and dedicate my efforts, in the pursuit of scholarly knowledge, to those Africans and African Americans who suffered, fought, and sacrificed so that I and the rest of their progeny may have the opportunity to succeed and pass this spirit on. I also honor and dedicate this project to my wife, Lisa, who has been able to help me grow, as a person, in ways that the pursuit of scholarship cannot begin to do. Please continue to educate me about myself and about us. I love you.
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VITA

21 August 1968...........................................Born - Washington, D.C.

1989........................................................Research assistant, Department of Neurosciences, Walter Reed Army Institute of Research; Dr. G. Jean Kant, principal investigator.

1989........................................................Research assistant, ADMHA-MARC Research program, Howard University; Dr. Leslie Hicks, principal investigator.

1990........................................................B.A., Psychology, Howard University, Washington, D.C.

1991........................................................Research assistant, Affirmative Action Grant, Ohio State University, Dr. Dorothy Jackson, principal investigator

1993........................................................M.A., Psychology, Ohio State University

1995........................................................Course instructor; researcher, Murray State University

PUBLICATIONS


**FIELD OF STUDY**

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CHAPTER I

INTRODUCTION

An issue within the research community, pertaining to the undergraduate milieu, is the student's perception of her or his lack of "fit" (Pantages and Creedon, 1978). Whatever the source of this perceived lack of fit, such as differences between the student and the institution with respect to cultural values or lack of support for the student's career-role development, the short-term result may be the student's voluntary withdrawal from the institution and the long-term result may be a significantly less productive member of the society. This issue is important from a practical and educational perspective in that identifying the antecedents of dropout behavior in undergraduate students is critical so that effective intervention programs, at the institutional level, may be undertaken to head-off a student's final withdrawal decision (Pantages and Creedon, 1978). Psychologically, this issue is also critical because the potential long-term result may be a delay or complete disruption in the development of a person's career-role and overall ego identity which may lead to an increasingly vague or even negative self-concept and/or isolation from or frustration in one's current and future interpersonal roles.

The specific purpose of this study is three-fold: 1) to determine whether two alternative operationalizations of the dependent variable, "persistence", will yield a different set of predictors in the Institutional Integration model of undergraduate persistence; 2) to determine whether specific developmental issues and personal
student characteristics directly affect undergraduate students' persistence in the
Institutional Integration model; 3) to uncover any potential significant ethnic and/or
gender effects in students' intentions to voluntarily withdraw from the undergraduate
institution.

The theoretical work of Tinto (1975) has been the impetus of a current body of
empirical literature (i.e., Pascarella and Terenzini, 1983, 1980; Pascarella, Duby, and
Iverson, 1983; Pascarella and Chapman, 1983; Pascarella, 1985; Pascarella, Smart,
Ethington, and Nettles, 1987; Williamson and Creamer, 1988) generated to attempt to
explain the significance of undergraduate students' experiences, both background and
current, in their decisions to voluntarily withdraw from undergraduate school. A
series of studies (Pascarella and Terenzini, 1980, 1983; Pascarella, 1985; Pascarella,
Smart, Ethington, and Nettles, 1987; Stoecker, Pascarella, and Wolfe, 1988) have
consistently reported that variables related to the specific current experiences of the
undergraduate student are the only variables that consistently directly affect an
undergraduate students' subsequent dropout behavior. Background variables and
initial commitments, such as gender, ethnicity, socioeconomic status, goal and
institutional commitment have been found to only indirectly affect such students' level
of institutional integration and subsequent dropout behavior. Several studies,
however (Pascarella and Chapman, 1983; Pascarella, Duby and Iverson, 1983;
Williamson and Creamer, 1988), have provided evidence that, contrary to Tinto's
(1975) theoretical model, background characteristics have direct effects on students'
subsequent dropout behavior.

Pascarella, Duby, and Iverson (1983) and Pascarella and Chapman (1983), for
example, report that background variables such as a student's gender, race, and
aptitude directly predict voluntary withdrawal from two- and four-year commuter
undergraduate institutions. Furthermore, Williamson and Creamer (1988) suggest that when the more stringent criterion variables of "persistence in higher education" and "persistence at the institution" are specified, background and commitment variables also directly affect dropout behavior and may be stronger predictors than the student's current undergraduate experiences. The utility of these more specific criterion variables in this model of student attrition is supported by the finding of the variable "intentions" ("...to return to the university next fall") being the largest predictor of subsequent dropout behavior in freshman students at a commuter institution (Pascarella, Duby, and Iverson, 1983). Thus, it is critical to determine whether the strength of the effects of background characteristics, initial commitments, and current academic and social undergraduate experiences may vary in relation to the way in which the dropout criterion is operationalized.

Additionally, it is also critical to ascertain the contributions of specific developmental variables, such as ego identity and intimacy, in their effects on persistence decisions. Several writers have suggested identity (ie, Erikson, 1959, 1968; Waterman, 1982; and Levinson, 1986) and intimacy (ie, Orlofsky, 1993) development are critical lifetask issues during the transition into and during the period of early adulthood. Therefore, it seems necessary to empirically examine the potential impact these developmental issues have on the undergraduate student’s decisions to remain or leave the undergraduate institution, in order to more fully understand the processes involved in this socio-cultural institution’s preparation of them to assume adult roles.

Examination of the potential influence of task-related factors, such as establishment of a firm ego identity and commitment to one's career goal and academic institution, during the early adult transition period of ego development is essential
because this is the period in which Erikson (1959, 1968) and Levinson and his colleagues (Levinson, Darrow, Klein, Levinson, and McKee, 1978; Levinson, 1986) assert that the individual must begin to make occupational/career-role choices leading to commitments or face the problems of role isolation. The inability to commit to such choices and/or a delay in the establishment of these lifetask competence-related commitments, such as the serious consideration of dropping out of undergraduate school, may result in isolation from intimate interpersonal relationships and career roles or produce further intrapersonal conflict.

Another issue in this study focuses on ethnic group and/or gender effects. Several lines of research suggest that African Americans enrolled at predominantly white universities have academic and social needs that differ from those of European American students (i.e.; Suen, 1983; Parker, Scott, and Chambers, 1985; Pascarella, 1985; Lewis, 1987; Tracey and Sedlacek, 1988; Boyer and Sedlacek, 1988; Robinson, 1993). Similarly, a related body of research suggests that women, particularly those of visible racial ethnic groups, express feelings of isolation and more social alienation on white campuses as compared to their male counterparts (i.e., Lewis, 1987; Jackson, 1989). Therefore there is a need to determine if certain groups of students, particularly African Americans and/or women, are reacting to the context of the particular institution in which they are enrolled, in their decisions to seriously consider dropping out of the institution, or are generally dissatisfied with the pursuit of higher education.

This study is unique in that it examines potential differences in the set of predictors of undergraduate students' persistence, in relation to two alternative ways of its operationalization. Specifically, this study will explore the set of predictors when both "persistence at the institution" and "persistence in higher education" are
used as major criterion variables in the Institutional Integration model. These criteria are seen to be further informative to the Institutional Integration model because in this study they are designed to assess persistence intentions as opposed to persistence/withdrawal behavior. The advantage of assessing persistence intentions has been demonstrated in Pascarella, Duby, and Iverson's (1983) findings that "intentions" (of persistence at the institution) was the strongest predictor of students who voluntarily withdrew from their respective undergraduate institution. Therefore, if the advantages of predicting persistence intentions can be demonstrated, it may be used to more quickly identify students most at risk before they voluntarily withdraw from the institution and possibly allow for more effective intervention efforts to be used.

Despite their finding of the strength of the variable "intentions" as a predictor of persistence behavior, however, Pascarella and his colleagues (ie, Pascarella and Terenzini, 1980, 1983; Pascarella and Chapman, 1983; Pascarella, 1985; Pascarella, Smart, Ethington, and Nettles, 1987) have primarily focused on empirically testing Tinto's theoretical model of attrition by investigating the predictors of dropout/persistence behavior (from the institution). On the other hand, although Williamson and Creamer (1988) conducted an investigation specifically examining the different predictors of the two dependent variables, "persistence at the institution" and "persistence in higher education", they used very basic predictor variables that do not seem to adequately assess the complexity of the undergraduate student's experience. This study, however, will combine the strengths of both approaches. In doing so it will use the Institutional Integration model developed by Pascarella and Terenzini (1983), which contains multiple, sophisticated predictors that seem to better assess the richness and depth of the undergraduate student's experiences and perceptions, to
empirically test Tinto's theoretical model of student persistence while using a variation of Williamson and Creamer's (1988) more stringent forms of the persistence variable.

Another task of this study is to introduce the developmental variables identity and intimacy as potential predictors of students' persistence. No studies have been found, using the Institutional Integration model, that incorporate such or any developmentally-based constructs as potential predictors of dropout decisions despite the fact that Tinto's (1975) theoretical model is developmental in nature. As some have suggested (ie, Erikson, 1968; Waterman, 1982; Levinson, 1986), undergraduate students are actively considering their overall and career-role identities and current and future intimate interpersonal relationships, which may or may not be sufficiently encouraged by the undergraduate institution; thus, it seems likely that such issues may be critical to undergraduate students' decisions to leave or remain in the institution (or pursue the degree at all) and need to be empirically examined in this context.

Finally, this study is also unique in its attempt to investigate gender and/or ethnic differences in students' decisions to both leave the undergraduate institution and continue to pursue the undergraduate degree. In addition, students will be matched on a variety of characteristics in the attempt to control for critical extraneous variables that are often not taken into account or sufficiently controlled, beforehand, in investigations on this issue. This method will allow for a clearer interpretation of any potential ethnic or gender differences, as it is assumed that the students will not differ, initially, on those characteristics to which they will be matched.
CHAPTER II
LITERATURE REVIEW

Institutional Integration

A vital issue in the study of college attrition is the degree to which differential levels of social and academic integration and goal and institutional commitments contribute to the prediction of persistence and dropout behavior when the influence of pre-college characteristics is taken into account (Pascarella and Terenzini, 1980). Tinto's (1975) theoretical explanatory, predictive model of the dropout process posits academic and social integration in the institution as its central constructs. This longitudinal model views persistence and dropout behavior fundamentally as a function of the quality of the student's interactions with the academic and social systems of the undergraduate institution (Pascarella and Terenzini, 1980). To a lesser degree, the student's background characteristics (i.e., socioeconomic status, gender, race, expected major) and goal and institutional commitments influence the student's undergraduate performance and interactions with and ensuing integration into the academic and social systems of the institution (Pascarella and Terenzini, 1980).

*Institutional integration* is seen as a constellation of academic and social factors and commitments that combine to establish or hinder an undergraduate student's overall level of perceived "fit" within the institution (Pascarella and Terenzini, 1983). *Academic integration* is defined as the student's academic performance and her or his level of intellectual development, while *social integration* is described as the quality of peer-group relations and quality of student-faculty interactions (Pascarella
and Terenzini, 1980). *Institutional* and *goal commitments*, on the other hand, refer to the level of satisfaction with the undergraduate institution that one is attending and goals associated with graduation and career, respectively (Pascarella and Terenzini, 1980).

Tinto's (1975) notion that the actual collegiate experiences serve as the primary influence on dropout decisions has received theoretical support from others who suggest that active participation in classroom/formal and extracurricular activities (Astin, 1975) facilitate student development and integration within the institution (Niles, Sowa, and Laden, 1994). In short, the student's active participation and involvement in the institution may be a more important variable than pre-college characteristics or goal/institutional commitments (Astin, 1975).

**Influence of the Undergraduate Experience**

Pascarella and colleagues (Pascarella and Terenzini, 1980, 1983; Pascarella, 1985; Pascarella, Smart, Ethington, and Nettles, 1987; Stoecker, Pascarella, and Wolfe, 1988) have attempted to assess whether Tinto's multidimensional measures of academic and social integration would significantly differentiate between undergraduate persisters and those who voluntarily withdraw from the undergraduate institution (Pascarella and Terenzini, 1980). These empirical analyses provide a comprehensive test of Tinto's theoretical constructs and their estimated influence within an explanatory causal sequence (Pascarella and Terenzini, 1983).

It has been consistently reported that only the academic and social integration variables in the model significantly add to the amount of explained variance in students' subsequent dropout behavior (Pascarella and Terenzini, 1980; 1983). Background characteristics and commitments have generally not been found, in this model, to
directly influence persistence/dropout decisions, but are indirect effects, as they are mediated by students' actual collegiate experiences (Pascarella and Terenzini, 1983).

An exception to this general trend, however, is found in several studies, using the Institutional Integration model, reporting that background characteristics may have direct effects on dropout decisions of students both at commuter institutions (Pascarella and Chapman, 1983; Pascarella, Duby, and Iverson, 1983; Williamson and Creamer, 1988) and traditional 4-year colleges (Pascarella and Chapman, 1983; Williamson and Creamer, 1988). Using the more stringent criteria of "persistence in higher education" and "persistence at the institution", Williamson and Creamer (1988) found that goal commitment had the strongest direct effect on both dependent variables. Although four other background variables also affected persistence, neither academic integration nor social integration directly influenced "persistence in higher education". With respect to the sole dependent variable that is used in the traditional studies (ie, Pascarella and Terenzini, 1980; 1983), "persistence at the institution of initial enrollment", Williamson and Creamer (1988) report that both academic and social integration exert direct effects; however, background factors such as "socioeconomic status" and "high school grades", and goal commitment directly affect this dependent variable as well. In this case again, goal commitment exerts the strongest direct effect on "persistence at the institution.

With respect to the variable institutional commitment, on the other hand, Williamson and Creamer (1988) found it indirectly affected "persistence in higher education", through goal commitment, and was not related to any variables in the model when "persistence at the institution of initial enrollment" was used as the dependent variable. The lack of influence of institutional commitment may be attributed to its operationalization. Williamson and Creamer (1988) only used two
very general items to define institutional commitment, possibly limiting its potential as a predictor variable. A similar argument may be made for the operationalization of academic and social integration in the Williamson and Creamer (1988) study, which were limited to one item each. This restriction in items is in contrast to Pascarella's (1985; Pascarella and Terenzini, 1980, 1983) use of between 5-7 items per variable ("academic and intellectual development"), and two variables each constituting the constructs of academic and social integration. Thus, Williamson and Creamer's (1988) results may have been affected by the lack of item discrimination in several of their variables and may have affected their findings.

This study will also attempt to clarify other issues not sufficiently addressed by Williamson and Creamer (1988). Although they used a more stringent criterion for the persistence variable, it is unclear as to whether their criteria were primarily responsible for the reported direct effects of goal commitment or the lessened effects of academic and social integration on persistence. An alternative explanation may be that the operationally limited items that Williamson and Creamer (1988) used to designate academic and social integration and institutional and goal commitment (with only 1-2 items) may have erroneously contributed to findings that diverge from the existing literature using the Institutional Integration model. The approach this study will take is to directly compare the alternative and more stringent dependent variables ("persistence in higher education" and "persistence at the institution, respectively) while still using the multidimensional constructs of academic and social integration and initial commitments that Pascarella and his colleagues have used in their studies. By doing so, a clearer interpretation of Williamson and Creamer's (1988) results may be derived.
Developmental Variables

The developmental variables used in this study involve those that Erikson (1968) posits which pertain to the lifetask issues of identity versus identity confusion and intimacy versus role isolation. Establishing a sense of identity is viewed as the major developmental task during the transition from adolescence into early adulthood (Erikson, 1968). The college years are seen to be critical in this transition for this is the time in which the greatest gains in identity formation appear to occur (Waterman, 1982). Furthermore, achievement of a firm identity serves as the foundation for the development of an autonomous (Chickering, 1969) and competent self (Spencer, Swanson, and Cunningham, 1991). As Levinson (1986) argues, the undergraduate years serve as a vehicle for the primary task of "exploring possibilities for change in the self and the world, and to move toward commitment..." (p.7). Such movement toward a commitment is primarily achieved through the identification with or commitment to an occupational or career goal which is usually shaped during the undergraduate years.

Establishing a developed sense of intimacy is another major developmental task during the transition into early adulthood but particularly during the period of early adulthood itself (Erikson, 1968). Intimacy, which is developmentally preceded by identity (Erikson, 1959), involves an openness and sharing, a mutual trust (Orlofsky, 1993) in which the individual is able "to commit himself to concrete affiliations and partnerships and to develop the ethical strength to abide by such commitments..." (Erikson, 1963, p. 263). Establishment of a mutual psychologically intimate relationship with another adds to the base of an established identity, a self that is interpersonally competent during young adulthood and one whom is likely to be well-adjusted. Failure to establish a firm sense of identity and, subsequent psychological
intimacy, may lead one to become unproductive, undecided or uncommitted in one's career role. Furthermore, such an individual may become isolated from interpersonal roles and support and may make subsequent choices to choose alternative paths of development.

If undergraduate institutions fail in their ability to assist adolescents and young adults in gaining a sense of their overall ego and occupational career-role identities then it may be very likely that these students will be most likely to become a "career student", seriously consider withdrawal, and/or actually dropout of the undergraduate institution without attaining their degree. In any case, these academic alternatives may serve to disrupt the ability of the individual to successfully negotiate the tasks of identity and intimacy as well as future tasks in later adulthood. Therefore, during the transition into adulthood such developmental issues may directly influence the undergraduate's perceived efficacies and competencies and affect one's undergraduate experiences or decisions.

Ochse and Plug (1986) have operationalized these two Eriksonian theoretical constructs. *Identity* is defined as a sense of continuity and consistency in the self and social perceptions about the self, whereas *intimacy* is defined as the need for affiliation and commitment to another. These variables will be used to assess the predictability of the developmental variables on students' persistence at the undergraduate institution and persistence in higher education.

**Ethnic and Gender Differences in the Undergraduate Experience**

Research findings (Robinson, 1993; Mallinckrodt, 1988; Boyer and Sedlacek, 1988; Tracey and Sedlacek, 1984; Suen, 1983) strongly suggest that the perceived quality of peer interactions have a significant effect on ethnic/minority adolescents'
evaluative and motivational attitudes toward school; hence, these variables may further influence students' level of perceived fit and comfortability within the institution.

The experiences of ethnic/racial minority students at predominantly European American-centered colleges and universities, although similar in some respects, may be perceived as distinctly different. For example, a variety of studies report that minority students, particularly African Americans, perceive campus activities as being geared primarily for Euro-American students which often leads to a feeling of social alienation (i.e., Fleming, 1981; Suen, 1983; Tracey and Sedlacak, 1984; Lewis, 1986, 1987; Boyer and Sedlacak, 1988). When the social isolation is exacerbated, members of different ethnic groups may choose one of several coping options, such as withdrawal from the university, that may positively or negatively affect their subsequent undergraduate experiences and expectations.

With respect to gender, several studies report that female students (Robinson and Jackson, 1995; Jackson, 1989), and minority women (i.e., Fleming, 1981), in particular, experience higher levels of stress, isolation and social alienation compared to men. With women, their isolation relates to the perception of a lack of fit within the institution and lack of interpersonal relationships with faculty leading to increased feelings of alienation and an increased risk for these students to seriously consider voluntary withdrawal (Robinson and Jackson, 1995; Lewis, 1987; Fleming, 1981).

Therefore, a question to be addressed in this study is whether there are significant differences, by ethnicity and/or gender, of the persistence option these groups are more likely to consider. Specifically, will African Americans and European Americans or men and women, or an interaction, significantly differ in their consideration to leave the institution ("persistence at the institution") or to withdraw from the pursuit of higher education, in general ("persistence in higher education")?
significant differences are found on "persistence at the institution", for instance, it may suggest that one group feels less comfortable with the university and feels that leaving the institution is a legitimate option. This option may be less serious than that of discontinuing the pursuit of higher education because the former suggests the student may transfer to another university or may pursue higher education at a later time. The latter option, however, suggests that this group is inclined to give up on higher education and, may be faced with an even more difficult challenge of adequately developing career-role and ego identity commitments.

Extensions of the Institutional Integration Model

Although Pascarella and colleagues' (i.e., Pascarella and Terenzini, 1983, 1980; Stoecker, Pascarella, and Wolfe, 1988) empirical studies generally suggest that academic and social experiences are generally the only significant direct influences on the student's decision to stay or leave the school, Williamson and Creamer (1988) and Pascarella and Chapman (1983) provide evidence suggesting that background characteristics and initial (goal) commitments may be more influential than the institutional influences in explaining long-term persistence behavior, under more stringent circumstances. Consistent with the methodological concerns of Williamson and Creamer's (1988) study, it is this study's goal to further systematically assess the influence of these variables, within the same sample, on the separate dependent variables, "persistence at the institution" and "persistence in higher education" in testing Tinto's (1975) theoretical model of persistence. The results of such a direct comparison of these dependent variables within the complete multidimensional Institutional Integration model will provide critical insight with respect to the methodology of future assessments using this model.
Furthermore, despite the majority of the Institutional Integration literature strongly suggesting that social and academic integration emit the only direct effects on undergraduate students' persistence, it is this study's attempt to determine whether developmental issues, such as personal identity, and initial goal and/or institutional commitments may, in fact, exert direct influences on students' persistence in higher education and/or persistence at the institution. If these relationships are found, then separately assessing these dependent variables may be a more effective approach toward predicting an undergraduate student's likelihood of attaining a college degree.

Therefore, the overall objectives of this study are to examine the set of variables that have direct effects on students' dropout intentions and assess potential ethnic/gender differences in the two specific persistence variables. The major questions of this study are: 1) does differentiating the persistence criterion variable into intentions of "persistence at the institution" and "persistence in higher education" elicit a different set of predictors; 2) do specific initial commitments (goal and institutional) and developmental (identity and intimacy) variables have direct effects on students' persistence ("persistence in higher education" and "persistence at the institution); and 3) are there ethnic group and/or gender effects in the prediction of withdrawal from the undergraduate institution versus completion of the undergraduate degree?

Hypotheses

Of the commitment and developmental variables examined, it is believed that institutional commitment will have the most significant effect on institutional dropout due to the sample comprising college upperclassmen who are more likely to be more invested in their respective institution. Therefore, the following hypothesis is:
**HO.1** Institutional commitment will have a direct effect on "persistence at the institution", whereas goal commitment and intimacy will have their effects on the dependent variable, "persistence at the institution", mediated through institutional commitment. Identity will only have direct effects on intimacy and goal commitment. (see figure 1)

The following hypothesis is based on previous literature (i.e., Pascarella and Terenzini, 1980; 1983) suggesting the importance of undergraduate students' actual and perceived experiences within the institutional network. Furthermore, because such literature suggests that withdrawal from the institution is tied to the quality and quantity of students' interactions, it is believed that social factors will be particularly predictive of institutional dropout:

**HO.2** Both Academic Integration and Social Integration will have direct effects on "persistence at the institution"; yet, social integration will have a stronger effect than academic integration on this dependent variable. Additionally, the effect of Academic Integration on "persistence at the institution" will be partially mediated by Social Integration. (see figure 2)

The following hypothesis is grounded in the assumption that a more stringent criterion of the dependent variable, "persistence in higher education", will have commitment (Williamson and Creamer, 1988) and developmental factors as significant direct effects:

**HO.3** Both Goal Commitment and Identity will have separate direct effects on the dependent variable "persistence in higher education". Identity will also be partially mediated by Goal Commitment in its effect on "persistence in higher education", as well as exhibiting a direct effect on Intimacy. Furthermore, Intimacy's effects will be expressed through Institutional Commitment, which, in turn, will be
mediated by Goal Commitment in its effect on "persistence in higher education". (see figure 3)

Because it is assumed that the variable of "persistence in higher education" is tied more specifically to achieving the goal of completing a degree, it is believed that perceptions of academic efficacy and continuity will be the major contributors, among the social experiential variables, to "persistence in higher education":

**HO.4** Academic Integration will have a direct effect on the dependent variable, "persistence in higher education", while the effects of Social Integration on "persistence in higher education" will be mediated through Academic Integration. (see figure 2)

It is important to determine whether there are systematic effects of particular groups of students pertaining to the issue of attrition. As previously discussed, it may be less difficult to effectively address issues specifically related to the institutional experiences than those of the students' value of higher education. There is a need, therefore, to directly assess whether there are any such differences among groups of students on either of these specific dimensions of attrition to more efficiently intervene and assist students if necessary. Therefore, the following exploratory hypothesis, based on ethnic and gender-related issues in the literature on retention (Robinson and Jackson, 1995; Jackson, 1989; Mallinckrodt, 1988; Boyer and Sedlacek, 1988; Tracey and Sedlacek, 1984; Suen, 1983; Fleming, 1981), is:

**HO.5** There will be effects of race, gender, and/or an interaction between them in the prediction of "persistence at the institution" and/or "persistence in higher education".
CHAPTER III

METHODS

Participants

African American and European American undergraduate students, from a major predominantly white university located in the midwestern region of the United States and a small, predominantly white university located in the mid-Atlantic region of the United States, comprised this sample. The students at the midwestern university were recruited from an introductory psychology pool and others were solicited from a campus student center and one black studies class during the university's spring quarter of 1995. Those participants from the mid-Atlantic university were recruited from a psychophysiology class and a black studies class during its spring semester of 1995.

A total of 178 participants, 89 African Americans and 89 European Americans comprised this matched sample. The proportions of African Americans and European Americans at the midwestern university are 7 percent and 82 percent, respectively; and 15 percent and 70 percent, respectively, at the mid-Atlantic university. There were 109 females (61.2%) and 69 males (38.8%), with a mean age of 19.8 years (s.d.=1.72; range=17-26 years) in this sample. The undergraduate population at the midwestern university was 47.8% female and 52.2% male, and 49.9% female and 50.1% male at the mid-Atlantic university. With respect to class designation, the sample consisted of 86 freshman, 29 sophomores, 40 juniors, 22 seniors, and 1 non-traditional student.
Procedure

The students chosen from the introductory psychology pool at the midwestern university received class credit for their participation and all of the students at the mid-Atlantic university received extra credit for their participation. The other students at the midwestern university, solicited from a university student center and black studies class, were volunteers and received no incentives for their participation. In both settings, only students who had been enrolled at their respective universities for at least two successive academic quarters/semesters were used. This requirement removes the effect of initial stress that may be felt on the part of the student, due to the novelty of the institution for first-year freshmen, as a significant factor.

The administration of the questionnaire packet to the students at both universities involved asking them to fill out one of two versions of the questionnaire. Two versions of the questionnaire were necessary as a precaution to compensate for a potential systematic response bias of the latter measures in the original packet due to potential fatigue factors. Thus, the latter measure in the original packet was presented first in the second packet, with the first measure in the original packet placed at the end of the second packet. Before administration of the questionnaire packets students at both universities were informed that the packet contained questions asking them about their general experiences at their respective universities and that any data reported would be in group, rather than individual, form so as to insure their privacy. When students returned their questionnaires, they were given a debriefing sheet fully explaining the purpose of the study.

A total of 383 questionnaires were collected from both universities (321 at the midwestern institution and 62 at the mid-Atlantic institution). An attempt was made to match, as closely as possible, each African American with a European American
counterpart on the following criteria (with matching priority given in this order): gender, identified major, age, class designation, marital status, and socioeconomic status. Due to incomplete questionnaires and the stringent nature of the matching procedure, the total sample of students used for this study was 178. A total of 138 students were used from the midwestern university (69 of each racial/ethnic group) and 40 (20 of each racial/ethnic group) from the mid-Atlantic university.

Variables

The specific variables/constructs of interest include: background characteristics; identity, intimacy; institutional commitments; goal commitments; academic integration; social integration; and persistence intentions.

1) Background characteristics

These data consist of the individual's gender, age, classification, intended major, SES (combination of the immediate family's estimated income level and the mean of the parents' highest level of education).

2) Developmental Variables

The operationalization of the developmental variables used in this study, identity and intimacy, are subscales that are part of a larger measure of personality development based on Erikson's theoretical model (Ochse and Plug, 1986). Identity is defined as "the development of a sense of continuity, consistency of the self-image and a set of social-self-perceptions that correspond to the way one is viewed by others" (Ochse and Plug, 1986, p. 1241). Intimacy, on the other hand, is viewed as an expression of the need for and achievement of affiliative commitment to another and mutual sharing (Ochse and Plug, 1986, p. 1241).
3) Goal and Institutional Commitments

Goal commitments refer to the importance attached to attaining an undergraduate degree (Pascarella and Terenzini, 1980) and interest in developing a career. Institutional commitments, on the other hand, pertain to the person's overall level of initial affiliation with her or his current institution and the level of importance of graduating from that institution.

4) Academic Integration

This construct is a composite of 3 variables ("faculty concern for student development and teaching", "academic and intellectual development", "frequency of career/academic contacts with faculty") designed to assess the level of the student's academic "fit" and intellectual stimulation experienced at the institution.

5) Social Integration

This construct consists of 3 variables ("peer-group relations", "informal relations with faculty", "frequency of personal/social contacts with faculty") tapping the level of the student's perceived social "fit" among the students and faculty within the institution.

6) Persistence

This construct is comprised of two criterion variables. One variable, "persistence at the institution" measures the student's likelihood or intentions of serious consideration about leaving the current institution. The other variable, "persistence in higher education", measures the student's likelihood or intentions of considering no longer pursuing one's undergraduate degree, regardless of the institution currently attended.
Instruments

Institutional Integration

This scale, devised by Pascarella and Terenzini (1980, 1983), is intended to measure Tinto's (1975) proposed predictive model of the dropout process. Academic integration, determined primarily by the student's perception of her or his academic performance and intellectual development, is comprised of: a 7-item, factorially derived scale measuring a student's perceived level of academic and intellectual development (alpha reliability=.74; item factor loadings ranging from .41 to .68); a 5-item, factorially derived scale measuring a student's perception of faculty concern for quality classroom teaching and student development (alpha reliability=.82; item factor loadings ranging from .54 to .77); a 3-item scale assessing the frequency (from 0 to 7 or more encounters) of nonclass, formal contacts with faculty for 10 minutes or more for academic/career-related reasons. With the exception of the last scale, the academic integration variables follow a 5-point Likert-type format (1=strongly disagree to 5=strongly agree).

Social integration is mainly a function of the quality of students' relations with both the peer-group and the faculty. The individual scales are: peer-group relations (7 items), alpha reliability = .84, item factor loadings range from .37 to .84; interpersonally relations with faculty (5 items), alpha reliability = .83, factor loadings range from .47 to .86; a 3-item scale assessing the frequency (from 0 to 7 or more encounters) of nonclass, informal contacts with faculty for 10 minutes or more for social/personal reasons.

Institutional commitments and goal commitments is a subscale that collectively assesses both a students' overall commitment to their choice of institution and overall commitment to the goals of career and graduation. One component of this overall
construct consists of a 6-item, factorially derived scale (alpha reliability = .71 and factor loadings ranging from .44 to .69). The second component of this measure consists of the sum of two items corresponding to goal commitment: a) "the lowest level of education that you would be satisfied with" (i.e., B.A. to Ph.D. or J.D.) (Williamson and Creamer, 1988) and b) the importance of graduating from college; and one item indicating the rank of choice of the students' current institution (Pascarella and Terenzini, 1983).

**Personal Identity Inventory**

The Personal Identity Inventory (Ochse and Plug, 1986) was designed to measure the personality components of individuals throughout the lifespan. A large sample (N=1,859) of subjects from South Africa (white South Africans and black South Africans) was used as the validation sample. *Identity* is viewed as a sense of continuity and consistency in the self and social perceptions about the self, whereas *intimacy* is seen as the need for and achievement of affiliation and commitment to another. The identity subscale is comprised of 19 items, the intimacy subscale is comprised of 8 items, and a social desirability subscale which consists of 16 items designed to control for effects of social desirability of the identity and intimacy subscale. Subjects respond to the items using a Likert-type format asking them how much each statement applies to them (1=never to 4=very often).

The reported internal consistency coefficients for identity and intimacy are .83 and .73 (white and black) and .79 and .62 (white and black), respectively. Convergent and discriminant validity were established by intercorrelations between scores on the identity and intimacy subscales and Well-being and Social Desirability scales, respectively. With respect to the social desirability subscale, the authors contend that the nature of the identity and intimacy subscales is such that there should be a
relatively higher correlation of each subscale with social desirability items than is
typical, in general, and that such effects can be partialled out in its analysis (Ochse and
Plug, 1986).

**Student Persistence Measures**

The variable "persistence at the institution" is taken from Mallinckrodt's (1988) measure of social support and consists of three items asking the student to what
degree she is "certain" about getting her undergraduate degree from the institution she
is currently attending. Thus, the variable is assessing the student's intentions about
dropping out of the institution. The three items decrease in degree of certainty (ie, "I
am certain that I will get my degree from 'name of university'...", "I have doubts...", to
"...finishing here is just not worth the hassle...") about whether the student believes she
will attain her undergraduate degree from her current institution. Items are scored in a
Likert format from 1 (Strongly disagree) to 5 (Strongly agree). The last two items,
indicating doubt about attaining the undergraduate degree from the current institution,
are reverse-scored; therefore, the higher a student's overall score on this variable, the
more likely she believes that she will attain her academic degree from the institution
that she is currently attending.

The items measuring the variable "persistence in higher education" were
created for this study but adhered very closely to those of Mallinckrodt's (1988).
Similar to the previous drop-out variable, this variable is assessing the student's
intentions about no longer pursuing the undergraduate at all. The three items increase
in degree of certainty (ie, "I am very sure that I will NOT get my undergraduate
degree at all", "I am unsure...", to "I am very sure that I will get my undergraduate
degree") about whether the student believes she will attain her undergraduate degree,
without regard to the institution she attends. Items are scored in a Likert format from
1 (Strongly disagree) to 5 (Strongly agree). The first two items, indicating doubt about attaining the undergraduate degree, are reverse-scored; therefore, the higher a student’s overall score on this variable, the more likely she believes that she will attain her academic degree, regardless of the institution that she attends.

Analysis

Preliminary Analyses

Due to the nature of this study, a series of exploratory factor analyses were performed on all of the scales used to find the best fit of items for this collective, cross-institutional sample. A principal axis factor model was chosen because it is more descriptive and does not assume a normal distribution. This latter criterion is critical because the participants are from two different populations. An oblique rotation was chosen because this procedure allows for the factors to be correlated. This aspect is important, as well, due to the subscales of both the Institutional Integration measure and the Personal Identity measure being conceptually and psychometrically intercorrelated (Pascarella and Terenzini, 1980; Ochse and Plug, 1986).

Subsequent to the factor analyses, a series of reliability tests were conducted to test the consistency of the individual items within each scale. These tests were conducted using the Cronbach alpha test of inter-item scale reliability. This procedure was carried out two ways. One method involved testing the alpha reliability of only those items in this study that corresponded to the predetermined factor loading cut-offs used in the literature for each major scale (Pascarella and Terenzini, 1980; Ochse and Plug, 1986). Specifically, Pascarella and Terenzini (1980) used .35 as their factor loading cut-off in determining which items, from their initial factor analysis, to keep and which to throw out. Ochse and Plug (1986) used a similar
procedure with respect to determining which items of the identity and intimacy subscales to keep. In this
instance, however, Ochse and Plug used .40 as their factor loading cut-off criterion (1986). Thus, in this study, alpha
reliability estimates were calculated for those items that met the previously established factor loading cut-offs in
the literature for each scale. Another method tested the inter-item reliability of all of the items within each scale, regardless of their specific factor loadings in this study’s analysis. After conducting alpha reliability tests under these conditions, the final
group of items used for subsequent analyses for each scale was selected, based upon the highest alpha reliability score, overall.

After the items for each scale were chosen the subsamples were tested for any institutional differences between the midwestern and mid-Atlantic universities with respect to their means and factor structures for each variable. Specifically, the goal with this procedure was to insure that there were no significant within-gender (ie, midwestern male vs. mid-Atlantic male) and within-racial/ethnic group (ie, midwestern African American vs. mid-Atlantic African American) differences in the means, using univariate analyses, on any variables, across institutions. Similarly, the subsamples were tested for differences on the hypothesized path relationships with respect to each institution’s correlation matrix factor structures, using a structural equation modeling package (Browne and Mels, 1994). An absence of significant differences in the analysis of the institutional means of each variable and correlation factor relationships would allow for the institutional subsamples to be collapsed into one overall sample and a complete analysis of the hypothesized path relationships.

Specific Hypotheses

Planned analyses of hypotheses HO.1 and HO.3 (see figures 1 and 3) were conducted using a series of simultaneous regressions. Preliminary factor analyses,
however, revealed a slightly different set of factors for this sample than reported in the literature (Pascarella and Terenzini, 1980, 1983). Specifically, the variable institutional commitment was subsequently replaced in further analyses with the factor-derived variable "satisfaction with the institution". In hypothesis 1 the major criterion variable, "persistence at the institution" (PAI), was regressed onto "satisfaction with the institution" (formally, institutional commitment in figure 1). In hypothesis 3 with respect to the major criterion variable, both goal commitment and identity were tested in a simultaneous regression model as predictors of "persistence in higher education" (PHE). In both hypotheses 1 and 3, with identity and intimacy as criterion variables, background variables (socioeconomic status, ethnicity, gender) were their predictors and the effects of social desirability were partialled out. Furthermore in both hypotheses 1 and 3, because identity and intimacy were hypothesized to directly predict goal commitment and institutional commitment ("satisfaction with the institution"), respectively, each of their effects were partialled out of the separate simultaneous regression analyses with background variables as their predictors.

Consistent with the literature (Pascarella and Terenzini, 1983) academic integration was planned to be comprised of the variables "faculty concern with student development and teaching", "academic and intellectual development", and "frequency of nonclass contacts with faculty for career/academic reasons" and social integration was to be comprised of "peer group relations", "informal relations with faculty", and "frequency of nonclass contacts with faculty for personal/non-academic reasons". Preliminary factor analyses of the Institutional Integration measures in this study, however, yielded a slightly different set of variables that resulted in the construct of academic integration being composed of 2 factor-derived variables "personal and intellectual development through positive faculty interactions", and "faculty concern
for student development and teaching". Similarly, social integration, in this study, was subsequently comprised of the 2 factor-derived variables "frequency of nonclass contacts with faculty" and "peer group relations".

Planned analyses of HO.2 and HO.4 (see figures 2 and 4) were conducted using a series of simultaneous regressions. The criterion variable PAI was regressed onto both constructs of academic integration and social integration in HO.2 and academic integration was the hypothesized predictor of social integration in separate simultaneous regressions (see figure 2). In HO.4, the major criterion variable PHE was regressed onto academic integration and, using a separate simultaneous regression analysis, social integration was regressed onto academic integration. In HO.5, a multiple analysis of variance was used to test differences by gender, ethnicity, and their interaction on the variables of "persistence at the institution" and "persistence in higher education".
CHAPTER IV

RESULTS

Preliminary Analyses

Factor Analyses

With respect to the Institutional Integration scale, 3-, 4-, 5-, and 6-factor solution exploratory principal axis factor analysis models were tested using an oblique rotation. The most interpretable scree-test yielded a solution of 6 factors with eigenvalues ranging from 1.56 to 7.74 and accounted for 50 percent of the variance and was the most interpretable of all solutions tested. Although Pascarella and Terenzini (1980) originally derived a 5-factor solution with the Institutional Integration scale, the 6-factor solution fits well because this study included the variable "frequency of personal/academic nonclass contacts with faculty" from the literature, which Pascarella and Terenzini (1983) added to the Institutional Integration model in later studies. Consistent with the literature (Pascarella and Terenzini, 1980), items for each variable were selected based on a cut-off of .35 for each factor loading. The six factors derived were: "quality of peer relations" (PEERINT -- 6 items), "number of formal/informal faculty interactions" (NOQINTS -- 6 items), "faculty concern for student development and teaching" (FACNCN -- 5 items), "goal commitment" (GCOM -- 4 items), "personal and intellectual development through positive faculty interactions" (PIDEVPFI -- 3 items), and "satisfaction with the institution" (SATWINST -- 4 items) (see table 1, Appendix A). The factors "institutional and goal
commitment", "informal relations with faculty", and "academic and intellectual
development", derived in Pascarella and Terenzini's (1980) original factor analysis of
the Institutional Integration model, appeared to fragment and re-combine in this
sample to produce the factors "goal commitment", "personal and intellectual
development through positive faculty interactions", and "satisfaction with the
institution" (see table 1 for individual item factor loadings and percentages of
variance).

One, two, and three-factor solutions were tested, using a principal axis factor
analysis model, with each of the Personal Identity scales identity, intimacy and social
desirability. For all variables, a one-factor solution yielded the most interpretable
scree-test solutions. Consistent with the literature (Ochse and Plug, 1986), items for
each variable were selected based on a factor loading cut-off of .40. Fifteen items
loaded on the "identity" factor, producing a scree-test value of 5.17 (accounting for
27.2 % of the variance). Six items loaded onto the "intimacy" factor and yielded a
scree-test value of 1.88 (accounting for 23.5% of the variance), while five items loaded
on the "social desirability" factor yielding a scree-test value of 3.18 (accounting for
14.7% of the variance) (see table 2, Appendix A).

**Internal Consistency Estimates**

The next set of preliminary analyses involved calculating Cronbach alpha
estimates of internal consistency. Because of the exploratory nature of this study, two
methods were used to assess the reliability of each of these variables. One method
calculated the alpha reliability estimates for those items of all variables that met the
previously established factor loading cut-offs in the literature for each scale (.35 for all
Institutional Integration items and .40 for all Personal Identity items). Another
method tested the inter-item reliability of all of the items within each scale, regardless
of their specific factor loadings in this study's analysis. For the two major dependent variables, "persistence at the institution" and "persistence in higher education" internal consistency analyses yielded .79 and .74 Cronbach alpha estimates, respectively. Results further indicated that for all of the Institutional Integration variables, the best reliability estimates were obtained using those items derived from the .35 factor loading cut-offs. The alpha estimates ranged from .54 to .87 (see table 1) for these variables. The low alpha estimate of the variable "goal commitment" (.54) was the best result achieved, after dropping the item “What is the lowest level of education that you would be satisfied with?” from the analysis (see table 1), of the two methods attempted. Its low estimate may be due to the scaling of the items used. Specifically, of the four items that loaded onto this factor, one item, “the importance of graduating”, used a four-choice response Likert format while the others used a five-choice response format.

With respect to the developmental variables, only "identity" yielded the best reliability estimate (.84) using the .40 factor loading cut-off, which consisted of 15 items (see table 2). For both intimacy (.70) and social desirability (.72), however, the second internal consistency method yielded better estimates with the use of the entire set of items in this analysis (see table 2, Appendix A). Because the better alpha estimates involved using the entire set of items for intimacy and social desirability, each was comprised of 7 and 15 items, respectively, which were used for subsequent analyses.

In summary, the exploratory factor analyses produced six factors comprising the Institutional Integration model used for this study. With the exception of "goal commitment", "personal and intellectual development through positive faculty interactions" and "satisfaction with the institution", all other variables used in
subsequent analyses in this study were relatively consistent with those in previous literature (i.e., Pascarella and Terenzini, 1983). Thus, there were a total of 27 items used in the analysis of the Institutional Integration model. Exploratory factor analyses of the developmental variables yielded an original combined total of 26 items for the three variables identity (15 items), intimacy (6 items), and social desirability (5 items). However, due to higher alpha reliability estimates for both intimacy and social desirability with all of their items included in their separate alpha reliability analyses, the number of items used for each was 7 and 15, respectively (with 1 item each dropped from the original intimacy and social desirability subscales to achieve the reported final alpha estimates). Thus the final combined total of items used from the Personal Identity scale was 37 (15, 7, and 15 items for identity, intimacy, and social desirability, respectively).

**Institutional Differences**

Subsequent to the preliminary factor analyses and internal consistency estimates, analyses of the means of each variable and correlation factor structure of the path relationships of the hypotheses were conducted to test for institutional differences both within gender and within racial/ethnic status. Any significant differences of females between the two institutions, of European Americans between the two institutions, or of African Americans between the two institutions on the hypothesized path relationships would not allow the two institutional subsamples to be collapsed for the primary analyses, since such within-group differences would reveal these participants are from different populations.

The first set of analyses involved a series of one-way univariate analyses, performed separately by gender and racial/ethnic status, on all of the variables used in
this study. Results revealed no significant within gender or within racial/ethnic differences across the institutions.

**Correlation Factor Structures**

The final set of preliminary analysis performed was to test the correlation factor structures of the two subsamples to determine whether there are any significant differences between the institutional samples on any of the hypothesized path relationships. This was accomplished by using Browne and Mels’ (1994) RAMONA covariance structural modeling package. An absence of significant differences between the institutional subsamples with respect to the correlation factor structures of the path relationships would allow for the institutional subsamples to be collapsed and a more complete analysis of the hypothesized path relationships due to a larger sample size. Correlation factor structures were analyzed instead of covariances because the background variables (ie, socioeconomic status, gender, and ethnicity) and goal commitment contained items not scaled equivalently to the rest of variables. Correlation factor structure matrices were computed separately for each institution for each of the hypothesized path relationships. The respective point estimates (synonomous with beta weights in regression analyses), produced by RAMONA, for each institution were included with their respective standard errors, in an equation (see table 3, Appendix A), to yield a z-score. Z-scores equal to or greater than 1.96 were interpreted as indicating a significant difference between the point estimates of each institution; thus, the correlation factor structures for each institution were significantly different and that particular path relationship could not be analyzed with a collapsed sample.

Results show that of all the specific path relationships hypothesized (see figures 1-3, Appendix B), only the following path relationships revealed significant differences
in their factor structures between the midwestern and mid-Atlantic universities: "identity" directly predicting "intimacy" (hypotheses 1 and 3; see figures 1 and 3), "goal commitment" directly predicting "satisfaction with the institution" (hypothesis 1), and "satisfaction with the institution" directly predicting "goal commitment" (see figure 3) (for all z-score estimates see table 3, Appendix A). Since, overall, most of the hypothesized path relationships yielded no significant differences between institutions with respect to their factor structures and that those paths demonstrating significant differences between the institutions were not the major emphases of this study, it was decided to collapse the subsamples to achieve the total N=178. Despite the significant differences found between the path relationships of "identity" and "intimacy" and that of "satisfaction with the institution" and "goal commitment" it was determined that because these specific relationships do not directly affect the major research questions of this study, the subsamples would be collapsed and analyzed as planned.

Descriptive Statistics

After the specific items for each variable were determined through preliminary factor analyses and reliability tests and tests of institutional differences, the means and correlations of the overall, collapsed sample (N=178) were computed. Table 4 (Appendix A) lists the means, standard deviations, and minimum and maximum values for all initial continuous variables of the overall sample.

Intercorrelational analyses were performed to test the degree of relationship among the dependent and independent variables used in the specific hypotheses (see table 5, Appendix A). Intercorrelations between the background variables of "ethnicity" and "gender" and the other variables yielded point-biserial correlations
since they contain only two levels (African American/Euro-American and female/male, respectively).

With respect to the specific variables, "identity" had a significant moderate correlation with "intimacy" ($r = .47$, $p < .01$), and weak correlations with "social desirability" ($r = .37$, $p < .01$), "goal commitment" ($r = .27$, $p < .01$), "satisfaction with the institution" ($r = .28$, $p < .01$), "academic integration" ($r = .27$, $p < .01$), "social integration" ($r = .24$, $p < .01$), "persistence in higher education" ($r = .27$, $p < .01$) and "persistence at the institution" ($r = .26$, $p < .01$). The significant correlations between identity and intimacy suggest that the higher one's sense of continuity in self and social perceptions the higher is one's need for and achievement of affiliation and commitment to another. Furthermore, as the level of identity increases, one's satisfaction with the institution, positive feelings of academic and intellectual development, and quality of peer and faculty relations increase as well. Additionally, as the level of one's identity increases, the more likely one is to remain at the institution and continue to pursue at least an undergraduate degree (see table 5).

The variable of "intimacy" correlated significantly but weakly with "social desirability" ($r = .22$, $p < .01$), "persistence in higher education" ($r = .24$, $p < .01$), "persistence at the institution" ($r = .21$, $p < .05$), "academic integration" ($r = .19$, $p < .05$), "social integration" ($r = .21$, $p < .01$), "satisfaction with the institution" ($r = .23$, $p < .01$), and "ethnicity" ($r = .15$, $p < .05$). Therefore, as the level of intimacy increases, one is more likely to stay at the undergraduate institution and continue the pursuit of higher education, and feel more academically and intellectually developed. With higher levels of intimacy, one is also more likely to feel an increasing quality of faculty and peer relations and be satisfied with the institution. Additionally, the positive point-biserial correlation of intimacy and ethnicity indicates that European American students tend
to have a need for and feel more interpersonally connected/committed to others (table 5).

The variable of "goal commitment" had weak but significant positive correlations with the following variables: "persistence in higher education" (r = .31, p < .01); "persistence at the institution" (r = .38, p < .01); "social integration" (r = .24, p < .01); "satisfaction with the institution" (r = .23, p < .01). Thus, as a student's level of goal commitment increases, so does her desire to remain at her institution, her desire to pursue a degree in higher education, the quality of her relations with faculty and peers, and her overall satisfaction with the institution (table 5).

The variable "persistence in higher education" had several significant but weak positive correlations with several variables. For example, the strongest correlation it had was with "persistence at the institution" (r = .39, p < .01). It also had significant but very weak positive correlations with "social integration" (r = .16, p < .05), "satisfaction with the institution" (r = .18, p < .05), and a significant and positive point-biserial correlation with "ethnicity" (r = .17, p < .05). With respect to this sample, the more one intends to pursue a higher education the more one is inclined to remain at the institution, the higher the quality of the peer and faculty relations, and the more one is satisfied with one's experiences at the institution. Furthermore, the point-biserial correlation suggests that Euro-Americans, in this sample, are more likely to continue their pursuit of higher education (table 5).

The decision to remain at the institution was found to be correlated with several variables. For example, the higher one's expectation to stay at one's institution, the more likely he was satisfied with the institution (SATWINST; r = .48, p < .01), he was somewhat more likely to feel academically and intellectually fulfilled (ACDINTEG; r = .18, p < .05), he was also fairly more likely to report a higher quality
of peer and faculty relations (SOCINTEG; \( r = .16, p < .05 \)), and the more likely he was to come from a higher socioeconomic status (SES; \( r = .18, p < .05 \)) (for all see table 5).

With respect to one's feeling of being academically and intellectually developed ("academic integration"), a student in this sample was more likely to also experience a higher quality of peer and faculty relations ("social integration"; \( r = .34, p < .01 \)) and more likely to be satisfied with the institution overall ("satisfaction with the institution"; \( r = .35, p < .01 \)) (table 6). Similarly, the more one experienced a higher quality of peer and faculty relations ("social integration") the more that individual reported an overall satisfaction with the institution (SATWINST; \( r = .33, p < .01 \)) (table 5). Finally, Euro-Americans ("ethnicity") in this sample tended to be more satisfied with their institution (\( r = .22, p < .01 \)) and had a higher socioeconomic status (\( r = .15, p < .05 \)) (table 5).

**Specific Hypotheses**

With respect to the hypotheses under investigation, simultaneous regression-based path analyses were performed and used in the subsequent interpretations. Although these regression-based analyses was the primary means of analysis and source of interpretations for the hypotheses of this study, a correlation matrix path analysis model was tested with all of the variables of interest, hypotheses 1-4, simultaneously included in one path model. Because of its ability to correctly fit path analysis models to correlation matrices and significantly reduce error variance resulting from treating correlation matrices as covariance matrices (Cudeck, 1989) and its ability to produce standardized path coefficients with their standard errors, a correlation matrix path model was also computed for each hypothesized model using the RAMONA (Browne and Mels, 1994) program in the attempt to enhance further interpretation of the regression-based findings of this study. Potentially easier and
possibly more accurate interpretations were made of the data with the use of this program because it simultaneously controls the influence of all variables in the model while estimating specific path relationships and thus further reducing error (Browne and Mels, 1994). Although the correlation matrix path model is the ideal statistical procedure, compared to a regression-based path analysis, due to the many hypothesized paths and the comparatively small overall sample (N=178) of this study, it was decided to use the regression-based path analysis as the primary means of analysis and simply refer to the RAMONA-based path estimates as a comparative check of the regression results.

**HO.1** (Refer to figure 4, Appendix B, for the reduced path model and table 6, Appendix A, for the beta weights, partial r's and standard errors of all of the significant predicted paths for hypothesis 1) Although this hypothesis predicts direct effects of the background variables (socioeconomic status, ethnicity, gender) on "identity", none exerted such an influence on this variable. The only significant effect was the covariate for "identity", "social desirability". With respect to "intimacy", "ethnicity" (b = .24; partial r = .27) was the only background variable to exert a direct effect with the influence of "identity" controlled. Furthermore, "identity" (b = .44; partial r = .42) exerted a significant effect on "intimacy", controlling for the effects of "social desirability". The variable "goal commitment" received no significant effects from any background variables while controlling for the effects of "identity". Again, "identity" (b = .25; partial r = .23) was the only variable to have a significant effect on "goal commitment". With respect to "satisfaction with the institution" as the criterion variable, "goal commitment" (b = .31; partial r = .30), "ethnicity" (b = .21; partial r = .22), and intimacy (b = .19; partial r = .18) all had direct significant effects. Finally,
"satisfaction with the institution" exerted a significant direct effect on the criterion variable "persistence at the institution" \( (b = .51) \).

With respect to the correlation matrix of this hypothesized group of path relationships, virtually all path analyses yielded identical results with those already reported in the regression-based analyses. The only exception is that for the criterion variable of "intimacy", the background variable "ethnicity" (point estimate = .19; \( t = -2.99 \)) yielded a small but significant effect (table 9, Appendix A).

**HO.2** (Refer to figure 5, Appendix B, for the reduced path model and table 7, Appendix A, for the beta weights, partial r's and standard errors of all of the significant predicted paths for hypothesis 2) In this series of regression analyses only "academic integration" was a significant direct predictor of the criterion "persistence at the institution" \( (b = .18; \text{partial } r = .17) \), with the effects of "social integration" partialled out. With "social integration" as a criterion variable, "academic integration" was a significant predictor \( (b = .35) \). An interesting contradiction was uncovered in the matrix analysis of these path relationships. The hypothesized path relationship of hypothesis two yielded no significant effects of either academic or social integration on "persistence at the institution"; however, a similar significant relationship was found with respect to "academic integration" predicting "social integration" (table 9, Appendix A).

**HO.3** (Refer to figure 3, Appendix B, for the reduced path model and tables 6 and 8, Appendix A, for the beta weights, partial r's and standard errors of all of the significant predicted paths for hypothesis 3) The results of this analysis partially support the hypothesized paths. The majority of the hypothesized path relationships are reported under those of hypothesis 1 (table 6). The results of the hypothesized relationship of "satisfaction with the institution" predicting "goal commitment" can be
found under hypothesis 1 (table 6) as well, since the two variables' influences are merely reversed in this hypothesis. Two different path relationships under this hypothesis not found in hypothesis 1 show "identity" \( b = .25; \) partial \( r = .23 \) and "goal commitment" \( b = .23; \) partial \( r = .23 \) both directly predicting "persistence in higher education" while controlling for each other's influence "goal commitment". The correlation matrix of the path relationships of this hypothesis is consistent with the regression-based results reported (table 9).

**HO.4** (Refer to figure 5, Appendix B, for the reduced path model and table 7, Appendix A, for the beta weights, partial r’s and standard errors of all of the significant predicted paths for hypothesis 4) The results of this hypothesis indicate that "academic integration" had no significant direct effect on the dependent variable "persistence in higher education". On the other hand, "social integration" did have a significant effect on "academic integration" \( b = .26, \) partial \( r = .35 \). With respect to this hypothesis, the results of the correlation matrix of these path relationships were consistent with those discussed in the context of the regression analyses (table 9).

**HO.5** This hypothesis tested for significant effects by gender, ethnicity, or an interaction on the variables "persistence in higher education" and "persistence at the institution" using a multiple analysis of variance. Although there was no significant main effects or interaction found in this analysis, a power analysis of all three sources revealed that the interaction term had a very low power (.07). Therefore, there was a possibility of committing a Type II error, or not detecting an effect that is actually present. Gender also produced no significant effects on either dependent variable, and this analysis only yielded a power of .41. Although the power of this specific effect is relatively low, there is less of a likelihood that a Type II error had been committed. With the effect of ethnicity, however, the results indicate that this effect just missed
significance at F=.09 while still only having a power of .48. Thus, with ethnicity, there is a much more likely chance that a Type II error had been committed with the analysis of this effect on the dependent variables.

**Post-Hoc Analyses**

Due to the complexity of the Institutional Integration model only a limited set of hypothesized models were able to be reasonably analyzed using regression-based path analysis, the primary means of analysis in this study. Specifically, this study separately analyzed the effects of the background variables (socioeconomic status, ethnicity, and gender), the developmental variables (identity and intimacy), and "goal commitment" and "satisfaction with the institution" (SATWINST) on the two dependent variables, "persistence at the institution" (PAI) and "persistence in higher education" (PHE) from the effects of academic and social integration on the two dependent variables. Therefore, a simultaneous and complete analysis of the Institutional Integration model was not performed. The ideal and most consistent method, with the literature, examines the effects of all of the variables in the Institutional Integration model together using a covariance structure modeling equation to simultaneously estimate and control for their effects.

Such was possible in the post-hoc analysis using the RAMONA (Browne and Mels, 1994) covariance structure modeling package which can correctly fit path analysis models to correlation matrices without the problem of errors typically involved with such a procedure under alternative means of analysis (Browne and Mels, 1994). Figures 7 and 8 (see Appendix B) present the results of the proposed post-hoc path relationships, based on the a priori results of those hypothesized in this study, for the major dependent variables PAI and PHE, respectively. The point estimates and standard errors derived are based on standardized correlation matrices, and not
covariances, since the background variable ethnicity, the developmental variables, and the two dependent variables (PAI and PHE) are scaled differently from those variables belonging to the Institutional Integration model.

Of note with this series of post-hoc analyses are the indirect effects of academic and social integration on both PAI and PHE, as well as the direct effects of SATWINST on PAI and ethnicity, goal commitment, and identity on PHE. These post-hoc path relationships are derived from the results of the analyses of this study's a priori hypotheses and intercorrelational analyses, as well as the theoretical (Tinto, 1975) and empirical (Pascarella and Terenzini, 1980, 1983) literature. A priori analyses of the correlation matrices of hypotheses two and four revealed no significant effects of either academic or social integration on either of the major criterion variables, PAI or PHE. Post-hoc analysis supports the revised model indicating both academic and social integration only exert indirect effects on both PAI and PHE. With respect to PAI, academic integration transmits its effects through both SATWINST and identity at relatively equal strengths (.24, std. err = .07 and .22, std. err = .07, respectively; see figure 7). Social integration exerts relatively equal indirect effects on PAI through identity (.16; std. err = .08), goal commitment (.18; std. err = .07), and SATWINST (.17; std. err = .17) (see figure 9). Academic and social integration display identical results in their indirect effects on PHE (see figure 9). Although ethnicity, the only background variable in the post-hoc model, exerts indirect effects on PAI through SATWINST, it has a direct effect (.19; std. err = .07) on PHE (see figure 10).

With respect to PAI in the post-hoc model, SATWINST (.41; std. err = .06) and goal commitment (.28; std. err = .06) exerted significant direct effects; furthermore, their effects are first and second in magnitude, respectively in this overall
model (see figure 7). Goal commitment (.24; std. err = .07), identity (.22; std. err = .07), and ethnicity (.19; std. err = .07) all exerted significant direct effects on PHE (see figure 8). Furthermore, identity still exerts its direct effect on PHE despite its significant direct effect on goal commitment (.23; std. err = .07) as well (see figure 8).

Overall, each post-hoc model demonstrates excellent fit with respect to the observations in this study. Maximum likelihood discrepancy function estimates were derived and produced estimates of the root mean square error of approximation (RMSEA). The RMSEA gives an estimate of the degree of fit of the model to the data. Values of .05 or less indicate excellent fit, values of .08 denote an acceptable fit, and values of .10 or higher indicate a poor fit of the model to the data. The RAMONA program also uses the chi-square statistic to test the degree of fit of the model to the data, using indices of "perfect fit" and "close fit". "Perfect fit" indicates that the hypothesized covariance/correlation model perfectly matches the observed data, whereas the index of "close fit" indicates that the covariance/correlation model fits the observed data with more relaxed standards, compared to that of "perfect fit". If the probability estimates of the chi-square value are greater than .05 for either measure of perfect fit or close fit, then the interpretation is made that the chi-square value is not significant and the null hypothesis must be accepted. Therefore, with a statistically nonsignificant chi-square value, it is concluded that the covariance/correlation model must either "perfectly fit" and/or "closely fit" the specified observations.

With respect to the overall fit of the observed data reported, within the specified post-hoc models of this study, the RMSEA = 0.00 and 0.02 for the models predicting persistence at the institution and persistence in higher education, respectively. Therefore, both models demonstrate an excellent fit with the observed data. For the model predicting persistence at the institution (figure 7), the chi-square
value of 10.39 (df=13) is not statistically significant with probability estimates of 0.66 (perfect fit) and 0.90 (close fit); therefore, the post-hoc model predicting students' persistence at the institution perfectly fits the observed data. For the model predicting persistence in higher education (figure 8), the chi-square value of 14.24 (df=13) is not statistically significant with probability estimates of 0.36 (perfect fit) and 0.72 (close fit); therefore, the post-hoc model predicting students' persistence in higher education also perfectly fits the observed data.
CHAPTER V
DISCUSSION

The overall purpose of this study was to test the predictiveness of Tinto's (1975) theoretical model of persistence, using Pascarella and Terenzini's (1980, 1983) empirical model of Institutional Integration. Specifically, this study sought to test whether differences in the operationalization of the model's dependent variable, "persistence intentions/behavior" would result in a different set of predictors than those already established in the literature and whether the two developmental variables, identity and intimacy, produced significant effects on persistence intentions. The specific questions of interest in this study were: 1) do the dependent variables of "persistence at the institution" and "persistence in higher education" yield different sets of predictors?; 2) do any background variables such as socioeconomic status, ethnicity, gender, goal commitment and institutional commitment and the developmental variables of identity and intimacy directly affect either of the two dependent variables of interest?; 3) are there any significant ethnic and/or gender effects in undergraduate students' persistence in either higher education and/or at their respective institution? From these first two general questions a set of hypothesized path relationships were analyzed, while a formal hypothesis was proposed to address the third specific question.
Correlations

Overall, the intercorrelational analyses yielded results consistent with much of the literature. For example, those with higher levels of identity tended to have higher levels of intimacy which is supported, theoretically by Erikson (1968) and empirically by Ochse and Plug (1986). With respect to the factor-derived Institutional Integration variables (goal commitment -- GCOM, academic and social integration, satisfaction with the institution -- SATWINST), the results and subsequent interpretations in this study are similar to those of Pascarella and Terenzini (1980), suggesting that the Institutional Integration variables share significant but weak correlations and are thus assessing fairly independent dimensions of this model. The exception with these results is that GCOM is unrelated to academic integration. This finding is peculiar in that previous research reports goal commitment either affecting and/or being affected by academic integration (Pascarella and Terenzini, 1983; Pascarella and Chapman, 1983; Pascarella, Duby, and Iverson, 1983; Williamson and Creamer, 1988). The lack of association between goal commitment and academic integration in this study may be due to the few number of items that loaded onto this factor in the exploratory factor analysis.

Collectively, the developmental variables showed weak but significant correlations with all of the Institutional Integration variables with the exception of intimacy, showing no significant relationship with goal commitment. Again, this finding may be due to the few number (3) and/or types of items loading on GCOM. Conceptually, however, it may be argued that these results are consistent with the theoretical literature in that, for example, the construct of identity involves the consistency in one's own and one's perceived social perceptions and expectations.
about the self (Erikson, 1968; Ochse and Plug, 1986) which leads to a more competent self (Spencer, Swanson, and Cunningham, 1991). More specifically, ego identity involves, among other things, the integration of a self-definition and accepted group standards contributing toward a commitment to a personal ideology (Dyk and Adams, 1990). Thus, an undergraduate student's sense of identity should be related to his goal commitments, academic and social experiences at and satisfaction with the undergraduate institution. An undergraduate student's level of intimacy, on the other hand, should be less related to specific goal commitments and more related to aspects of the undergraduate student's direct/indirect experiences with others at the institution.

Collectively, the background variables of socioeconomic status (SES), ethnicity (ETH), and gender (GEND) demonstrated very few significant relationships with the other variables of interest. The variable SES significantly correlated with persistence at the institution, a finding consistent with that of Williamson and Creamer (1988). Ethnicity's correlation with both "persistence in higher education" and "satisfaction with the institution" is consistent with both theoretical and empirical literature with respect to these variables (i.e., Fleming, 1981; Suen, 1983; Tracey and Sedlacek, 1984; Lewis, 1986, 1987; Boyer and Sedlacek, 1988). Gender, however, demonstrated no significant associations with any of the variables in this study. The lack of a significant relationship of this variable with any of the variables in this study is contrary to findings of gender being related to "persistence in higher education" (Williamson and Creamer, 1988) and academic integration (Pascarella and Terenzini, 1983) as well as other studies reporting significant gender differences with respect to students' actual and perceived experiences at the undergraduate institution (i.e., Fleming, 1981; Robinson and Jackson, 1995).
With respect to the persistence variables, the demonstration that "persistence at the institution" (PAI) and "persistence in higher education" (PHE) result in moderately weak but very significant correlations suggests that they are tapping separate dimensions of persistence. Hence, the operationalization of persistence into separate dimensions seems to be a very promising and enriching addition to the retention literature, as suggested by Williamson and Creamer (1988). Furthermore, PAI weakly but significantly correlated with the developmental variables, intimacy and identity, and the Institutional Integration variables. Of note is its moderate correlation with SATWINST, which is consistent with the research suggesting that how much a student is satisfied with his undergraduate institution and its agents will be related to their motivational attitudes toward school (Robinson and Jackson, 1995; Boyer and Sedlacek, 1988; Tracey and Sedlacek, 1984; Suen, 1983) and possibly the likelihood of whether they will persist at that institution, as well.

The other persistence variable PHE also demonstrates weak but significant correlations with the developmental variables and all of the Institutional Integration variables except academic integration. At first glance, the lack of a relationship between PHE and academic integration conflicts with theories and empirical findings of persistence being related to academic integration as Tinto (1975) and Pascarella and Terenzini (1980, 1983) suggest; however, this result suggests that PHE is indeed assessing a different dimension of persistence than PAI. This notion is accentuated by the finding that PHE correlates significantly with goal commitment, a variable that taps a dimension that in this study is also unrelated to academic integration but still predicts persistence (PHE) in other studies (Williamson and Creamer, 1988). Therefore, PHE appears to be assessing a dimension of persistence that is unrelated to a student's academic experiences at the university. Furthermore, PHE demonstrates a very weak
but significant correlation with social integration. Once again this suggests that PHE taps aspects of undergraduate students' persistence attitudes that are relatively independent of their experiences at their respective universities.

**Hypotheses**

Because of the exploratory nature of this study, the results of the five hypotheses will be discussed in the context of both the existing literature and post-hoc speculation.

**HO.1** (Refer to figure 4 for the path diagram of all of the significant predicted paths in hypothesis 1) Overall, the path model of the hypothesized relationships was partially supported. The variable "intimacy" was only directly affected by one background variable, ethnicity. With intimacy operationalized as a need for affiliation and mutual sharing and commitment to another, this finding makes sense with respect to the body of literature suggesting significant racial/ethnic differences among undergraduate students on variables examining related areas such as "need for support" (Robinson and Jackson, 1995), and "fear of isolation/social alienation" (Suen, 1983; Fleming, 1981). The lack of a significant direct effect of any background variable on "identity" is not terribly surprising in that none of these variables were specifically operationalized to tap specific crisis-provoking areas that Erikson (1968) suggests would be critical to issues of identity; however, because each of these variables could potentially influence greater aspects of sources of conflict potentially contributing to issues of identity, as well as intimacy, it was nevertheless hypothesized that each of these variables may have an effect. Although "identity" exerted the hypothesized direct effect on "intimacy", interpretations of this finding would be precarious since preliminary analyses revealed that the separate institutional subsamples yielded significant differences on this path.
As suggested in the discussion of the correlational analysis, the variable "goal commitment" demonstrated none of the hypothesized effects from any background variables. Again, with respect to goal commitment, this finding is contrary to other literature reporting goal commitment being affected by either race/ethnicity (Williamson and Creamer, 1988; Pascarella and Terenzini, 1983) and/or socioeconomic status (Williamson and Creamer, 1988). Explanations for this lack of relationship between goal commitment and the background variables may be due to its relative lack of factor-derived items that could possibly relate to such variables in the predicted ways. The variable "identity", however, was the only hypothesized variable in the model to have a significant effect on "goal commitment" (see table 6). As previously mentioned, it appears as if issues of identity, involving commitments to a personal ideology (Dyk and Adams, 1990), have a significant importance on the goal commitments that students make. Such a finding adds to the speculation that issues of identity are of critical importance to the young adulthood transition (Erikson, 1968), in general, and to specific contexts of future career-role life decisions (Erikson, 1968; Robinson, 1993).

With respect to "satisfaction with the institution" as a criterion variable, "ethnicity" and intimacy both demonstrated the hypothesized direct effects. These findings appear to be consistent with the body of literature examining undergraduate students' interpersonal satisfaction relating to their overall perceptions or appraisal of their respective undergraduate institutions (i.e., Robinson and Jackson, 1994; Lewis, 1986, 1987; Fleming, 1981). The finding of "goal commitment" predicting "satisfaction with the institution" cannot be sufficiently interpreted because of significant institutional differences, between the two subsamples, found in preliminary analyses preventing further speculations about the specific relationship of this path.
Finally, "satisfaction with the institution" exerted a significant direct effect on the criterion variable "persistence at the institution". The support of this hypothesized relationship appears to be appropriate from an intuitive perspective. Support from the empirical literature, however, leave interpretations that are not as easily clear-cut because this literature specifically examines the construct of "institutional commitment" in its relationship with persistence (Pascarella and Terenzini, 1980, 1983; Pascarella, Duby, and Iverson, 1983; Pascarella and Chapman, 1983; Williamson and Creamer, 1988).

In the preliminary analysis of this study, exploratory factor analyses produced a factor containing items that were slightly different from those reported in the literature for the variable "institutional commitment" (see table 1). As a result, the variable was renamed "satisfaction with institution" and focuses slightly less on a student's initial commitments to the institution and more on how the student perceives the institution to be fitting or committing to the student's needs or expectations. Thus, despite some reports in the literature finding institutional commitment having no direct effect on persistence (at the institution) at 4-year residential institutions (Pascarell, Duby, and Iverson, 1983; Williamson and Creamer 1988), and others reporting that institutional commitments do exert direct effects on overall persistence at 4-year residential institutions (Pascarella and Terenzini, 1983; Pascarella and Chapman, 1983) as well as 2-and 4-year commuter institutions (Pascarella and Chapman, 1983), this study cannot confidently address that specific issue in the literature since the variable, "satisfaction with the institution" only, at best, approximates that particular construct. Nevertheless, with such a robust beta weight indicating the apparent predictiveness that "satisfaction with the institution" has for one of the primary criterion variables of interest in this study, "persistence at the institution", this particular variable may be an
equally, if not more fruitful, variable to include in further analysis using the Institutional Integration model.

Analysis of the correlation matrix of the hypothesized group of path relationships of background and commitment variables predicting persistence at the institution yields fairly consistent results with those of the regression-based analyses (table 8). Of particular interest to this study is the consistency between both sets of analyses, of the effect of ethnicity on intimacy suggesting that there may be differences in which African Americans and European Americans perceive their level of intimacy. It is possible, for example, that because of the particular importance African Americans place on social interaction and interpersonal relations, in general, and particularly at the undergraduate level (i.e., Robinson and Jackson, 1995; Tracey and Sedlacek, 1984; Suen, 1983), they could be dealing with issues of intimacy significantly more than their European American counterparts or feeling, more specifically, that their needs for interpersonal affiliation with peers and/or faculty at the institution are not being sufficiently met.

**H0.2** (Refer to figure 5 for the path diagram of the significant predicted paths in hypothesis 2) The partial support of the predicted path relationships of academic and social integration predicting persistence at the institution has mixed support with other findings in the literature. For example, academic integration directly predicts persistence in 2-year commuter institutions (Pascarella, Duby, and Iverson, 1983; Williamson and Creamer, 1988) and 4-year primarily residential institutions (Pascarella and Terenzini, 1980, 1983; Williamson and Creamer, 1988); however, these studies also reported social integration as having a direct effect on persistence as well. Furthermore, Pascarella and Chapman (1983) report academic integration as having no direct effect on persistence for students at 2- and 4-year commuter institutions and 4-
year primarily residential institutions, while social integration having a direct effect on persistence at 4-year residential institutions.

The lack of a significant effect of social integration on persistence (intentions) at the institution in this study is puzzling in that one may assume that factors relevant to a student's decision to remain at that particular institution should be significantly related to the student's interactions with and/or perceptions of the faculty and peers. This finding may be due to at least two factors unique to this study: 1) the preliminary factor analysis of the study involved the incorporation of some items into the academic and social integration constructs that were not included in the factor-derived (Pascarella and Terenzini, 1980, 1983) or theoretical (Tinto, 1975; Williamson and Creamer, 1988) constructs of other studies; 2) the nature of the major criterion variable, "persistence (intentions) at the institution", may be such that aspects of persistence that it taps may not be significantly accounted for by social integration, above and beyond the effects of academic integration and possibly other variables not included in this specific hypothesized path model. The latter possibility is supported by the finding of Pascarella, Duby, and Iverson (1983) that while academic integration predicted "intentions to re-enroll at the university next fall" (p. 92), social integration did not directly predict this variable.

Examination of the correlation matrix of this hypothesis yielded results that possibly support the second speculation made in the previous discussion of the results of hypothesis two. Specifically, point estimates of the paths for both academic and social integration on "persistence at the institution" were found to be statistically nonsignificant, while only the path for academic integration predicting social integration was significant (table 9). With the consideration that a greater amount of control for error is exercised in the correlation matrix analysis of the Ramona program
(Browne and Mels, 1994), compared to regression-based path analyses, one may infer that in this specific model of hypothesis two, it appears as if neither academic nor social integration have any significant direct effects on the operationalized variable "persistence at the institution". In consideration of the Institutional Integration model, overall, it seems that the effects of academic and social integration are not as pervasive as Tinto (1975) originally speculated. It appears as if the nature of the institution, residential or commuter, and the effects of other variables in the model have a significant influence on how either of these variables impact "persistence at the institution".

**H0.3** (Refer to figure 6 for the beta weights of all of the significant predicted paths for hypothesis 3) The hypothesized path relationships were partially supported in the regression-based analyses. Due to the high degree of similarity in this hypothesized model with that of hypothesis one, the discussion for most of the significant path relationships found in this hypothesis may be followed in the context of the discussion of the results in hypothesis one. The unique and significant path relationships found under this hypothesis include both "identity" and "goal commitment" directly predicting "persistence in higher education", controlling for each other's effect.

The finding of goal commitment significantly predicting "persistence in higher education" is a replication of Williamson and Creamer's (1988) results in their sample of 2-year commuter and 4-year residential institutions. Although they were assessing students who have voluntarily withdrawn from the institution and not their "intentions to pursue higher education", Pascarella and Chapman (1983) found goal commitment to predict dropout behavior in 4-year residential institutions, 2-year commuter institutions, and a pooled university sample (2-year commuter, 4-year residential and
4-year commuter). On the other hand, separate observed models of 4-year commuter samples (Pascarella and Chapman, 1983; Pascarella, Duby, and Iverson, 1983) found no direct effects of goal commitment on dropout behavior. With respect to the data of this study and the findings of Williamson and Creamer (1988) it appears that a student's level of goal commitment does indeed predict whether or not the student will continue to pursue higher education.

Although identity has been operationally defined as one's sense of continuity in the self image and consistency between the self and social perceptions about the self (Ochse and Plug, 1986), the variable representing this construct is made up of several items that clearly appear to relate to issues pertinent to one's pursuit of higher education (see table 2 for list of factor-derived items for identity). Furthermore, based on the theoretical writings of those in the identity literature (Spencer, 1991; Levinson et al., 1978; Erikson, 1968), it may be reasonably speculated that a student's occupational and/or career-role choices, such as the pursuit of higher education, may be directly related to her or his perceptions of self- and task-competence as well as one's overall commitment to those and related goals. Thus, the finding of identity directly predicting persistence in higher education make theoretical sense.

Analysis of the correlation matrix of the hypothesized group of path relationships of background and commitment variables predicting persistence in higher education yields fairly consistent results with those of the regression-based analyses (table 9).

**HO.4** (Refer to figure 5 for the beta weights of all of the significant predicted paths for hypothesis 4) The results of this regression analysis revealed partial support for the hypothesis. Specifically, although "academic integration" had no significant direct effect on the dependent variable "persistence in higher education", "social
integration" did have a significant effect on "academic integration" (see table 7). The correlation matrix analysis of these variables suggests an identical pattern to those regression-based results (table 9).

The lack of a significant effect of academic integration on persistence in higher education further suggests that the effects of academic integration (as well as social integration) may not be direct when the persistence variable is more clearly defined as either "persistence in higher education" or "persistence at the institution". Although the criterion variable "persistence in higher education" has not been specifically empirically examined in most of the literature, it has been directly or indirectly examined in two studies by Williamson and Creamer (1988) and Pascarella, Duby, and Iverson (1983), respectively. With respect to 4-year residential, 2-year commuter, and 4-year commuter institutions, these studies report no direct effects of either academic or social integration on "persistence in higher education" (Williamson and Creamer, 1988) or "intentions to return next fall".

Similar to the rationale in the discussion of hypothesis two, in consideration of the Institutional Integration model, overall, it seems that the effects of academic and social integration may be only indirectly passed through other variables in the model, with respect to the "intention" variables of "persistence in higher education" and "persistence at the institution" and/or their effects vary according to the residential/commuter status of the institutional sample. This explanation for the data in this study is even clearer when considering that although the sample consisted of undergraduate students from primarily residential 4-year institutions, it is quite possible that many of the respondents may have been commuter students as well. As Chickering (1974) and George (1971) suggest, students at a commuter institution and students who commute to a residential institution may be an entirely different
population than those students who reside on campus. If such is the case, then this explanation may account for the different influences of variables in the Institutional Integration model, in this study and others like it, and the findings of other studies (i.e., Pascarella and Terenzini, 1983) more in line with Tinto's (1975) theoretical notions.

**HO.5** The hypothesis of a main effect for either gender or ethnicity and/or their significant interaction on the variables "persistence in higher education" and "persistence at the institution" was not supported. Despite the lack of statistically significant effects on either dependent variables, the overall lack of power demonstrated in this analysis leaves open the possibility that there may have been some effect not detected. Such is particularly the case with the effect of "ethnicity" predicting "persistence in higher education", in which the overall model just missed statistical significance (F probability = .09) while still producing a weak power estimate. Speculation of likely committing Type II error is particularly reinforced when also considering that the intercorrelational analysis in this study showed ethnicity being significantly correlated with persistence in higher education.

**Post-hoc Analyses**

The indirect effects of academic and social integration on both “persistence at the institution” (PAI) and “persistence in higher education” (PHE), together with the finding of direct effects of “satisfaction with the institution” (SATWINST) on PAI, and ethnicity, goal commitment, and identity on PHE (figures 7 and 8) suggest a somewhat different Institutional Integration model than has been posed by Tinto (1975) and empirically demonstrated in the literature (i.e., Pascarella and Terenzini, 1980, 1983; Williamson and Creamer, 1988). For example, although Pascarella and Terenzini (1980, 1983) report that academic and social integration are the primary predictors of persistence and Williamson and Creamer (1988) report academic and
social integration directly predict PAI, this post-hoc analysis demonstrates that, when persistence is more specifically defined, their effects become indirect and other predictors serve as direct effects on the persistence variables. This analysis is supported by the finding of no significant direct effects of either academic or social integration on either persistence variable, using covariance structural modeling, when academic and social integration are the only predictors in the model. If these predictors did emit significant direct effects on the persistence variables, then that should have been evident in the analyses of the models of hypotheses two and four. Even with the regression-based path estimates, academic integration only weakly directly affected PAI and had no significant effect on PHE at all. Social integration, on the other hand, demonstrated no effect on either PAI or PHE when academic integration was included in the model.

Closer examination of Williamson and Creamer’s variable “social integration” revealed that it comprised only one item, (“satisfaction with social life on campus”); thus, it appears as if their variable is more closely related to this study’s factor-derived variable, “satisfaction with the institution” (SATWINST) which was separate from the two factor-derived variables, “number of quality interactions with faculty” and “quality of peer relations” which were combined to produce the “social integration” construct in this study. Consequently, it appears as if Williamson and Creamer’s (1988) variable “social integration” is essentially equivalent to SATWINST and, thus, their model predicting PAI is more similar to this study’s post-hoc model predicting PAI (see figure 9) than it actually appears in the literature.

The post-hoc model predicting PHE (see figure 8) is more consistent with the findings of Williamson and Creamer (1988) on this variable. Williamson and Creamer (1988) report that goal commitment, gender, and socioeconomic status were the only
variables to directly predict PHE. The effects of academic integration and institutional commitment were mediated through goal commitment, while social integration’s effects were mediated by academic integration. In the post-hoc analysis, goal commitment, identity, and ethnicity all directly predicted PHE. As discussed under the results section of hypothesis three, the direct effects of identity and goal commitment on PHE were relatively equal, with ethnicity emitting a slightly weaker direct effect. Although not identical, the consistency between this post-hoc analysis and the findings of Williamson and Creamer (1988) suggests a direct influence of a student’s personal characteristics, commitments, and background factors that predict one’s likelihood of continuing to pursue an undergraduate degree.

Conclusions and Implications

The results of this exploratory investigation provided relatively clear answers to the questions of significance in this study. To the question of whether or not the specific operationalization of the dependent variable, “persistence”, into the more specific "intention" variables, persistence at the institution (PAI) and persistence in higher education (PHE), yields a different set of predictors, the evidence suggests that it does. Furthermore, the evidence also suggests that background variables/student characteristics (ie, ethnicity, gender, socioeconomic status), student commitments, and the developmental variable identity directly predict persistence. Specifically, students’ level of goal commitment and satisfaction with their institution are the only significant predictors of students’ likelihood of remaining at their respective institutions. All other potential influences, particularly students’ academic and social integration, are indirect and mediated by their level of goal commitment and/or satisfaction with their institution. With respect to PHE, students’ identity, goal commitment, and ethnicity all have direct influences on whether or not they continue to pursue higher education.
In the context of PHE as well, neither academic nor social integration directly predict a student's decision to pursue higher education.

These findings somewhat replicate those of Williamson and Creamer (1988) and reinforce the notion that: 1) persistence must be more specifically defined so that factors affecting a student’s decision to remain at a particular institution are not confounded with factors that more specifically influence a student’s decision to pursue a degree in higher education, regardless of the particular institution; 2) factors relating specifically to the student’s personal and developmental characteristics and commitments appear to have direct effects on her decision to remain at a particular institution and/or to continue the pursuit of an undergraduate degree, irrespective of the institution from which it is achieved; 3) although not addressed a priori, post-hoc speculation and discussion of the literature clearly suggest that the variation of variables predicting students' "intentions" to persist may depend upon whether students reside on-campus or commute to the institution.

As previously noted, this third possibility implies that students who commute, regardless of the residential status of the institution, may altogether have different experiences and/or expectations or perceptions about the nature of their social and academic integration that would cause these factors to be less important than others (Chickering, 1974; George, 1971), such as one's identity, goal commitment, or specific satisfaction with the institution. Pascarella, Duby, and Iverson (1983) speculate that inherent in Tinto's (1975) notions of the student's academic and social experiences being the key factors in influencing dropout behavior, are the assumptions that the institution provides sufficient opportunities for social interaction from both an academic/mentoring standpoint with faculty and affiliative standpoint with both faculty and fellow students. Pascarella et al. (1983) further note that the positive direct
effects of the students' experiences may depend a large part on the students' perceptions of their level of fit with the institution rather than whether or not specific mechanisms are actually (or theoretically) in place within the institution to promote such interactions. This speculation is consistent with the findings of many studies (ie, Fleming, 1981; Suen, 1983; Tracey and Sedlacek, 1984; Mallinckrodt, 1988; Boyer and Sedlacek, 1988; Robinson and Jackson, 1995) reporting the critical importance of students', particularly those of ethnic/minority status, perceived quality of peer and faculty interactions on their levels of perceived fit in and comfort with the institution.

Given that commuter students, by the nature of the institution or specific circumstances of the student, by definition typically have no involved interaction or investment in their institution beyond those which are necessary (ie, class attendance, library resources), such students are probably not as affected by their experiences because they do not expect that of their institution. As a result, such students are probably more motivated and influenced by personal characteristics such as their particular goal commitments and identities in their persistence at their respective institutions or persistence in continuing with their degree. Therefore, as much as these aspects of the student are clear and developed, the student will be more likely to matriculate and eventually attain her degree, with little direct influence of her specific experiences on-campus.

The third question of whether or not there are ethnic and/or gender effects in undergraduate students' persistence in either higher education and/or at their respective institution is unanswered; however, some insightful information was gained with respect to this issue. For example, although the MANOVA technique, overall, revealed no significant differences, the analysis had very low power. This latter point is particularly of note in light of finding that an ethnicity effect just missed statistical
significance at the .05 level (F probability = .09) while still producing a weak power estimate. Speculation of likely committing Type II error is particularly reinforced when also considering that the intercorrelational analysis yielded a significant correlation between ethnicity and PHE. More substantially, post-hoc correlation matrix analysis of the model predicting PHE demonstrated that ethnicity, while controlling for the influences of all of the other variables in the model, significantly predicted persistence in higher education. Therefore, it is highly possible that there is some significant effect of ethnicity on persistence in higher education.

These findings, although based on an exploratory investigation, suggest the possibility of a revised approach to the Institutional Integration model. Specifically, if this study’s results are replicated in subsequent analyses, there would be a compelling urge to revise Pascarella and Terenzini’s (1980, 1983) empirical model of Institutional Integration and possibly even that of Tinto’s theoretical model predicting persistence. If this study is replicated, the revision would likely involve specifying persistence in the manner of this and Williamson and Creamer’s (1988) study and in making a distinction between those students who commute to the university and those who reside on campus. Such a distinction in students' residential status incorporated into a priori hypotheses and analyses in this study would have probably yielded even clearer interpretations of these results within the context of the existing literature.

Furthermore, such specifications in the key dependent variable of persistence may suggest that the effects of academic and social integration, contrary to the views of Tinto (1975), Pascarella and Terenzini (1980, 1983), Astin (1984) and others, are indirect and may require more emphasis in other areas of undergraduate students’ lives in addition to that of their social or academic integration.
More practically, replication of this study’s findings would suggest alternative intervention directions leading to possibly more effective, short-term retention efforts which would most likely focus on very specific aspects of the student’s characteristics and/or experiences at the institution if it is determined that the student’s persistence at the institution is the critical concern. If, on the other hand, persistence in higher education proves to be the critical concern in the evaluation of a student’s drop-out decisions, more long-term and involved approaches focusing on the student’s motivations and attitudes about the advantages of achieving and disadvantages of not achieving an undergraduate degree may need to be addressed (see Steinberg, Dornbusch, and Brown, 1992; Sue and Okazaki, 1990 for examples).

A particularly divergent but extremely relevant direction, with respect to the traditional focus of the literature using this model of retention, is the inclusion of the specific developmental variables, identity and intimacy in the prediction of undergraduate persistence. As indicated in the theoretical writings of Erikson (1968) and empirical investigations of others (see Matteson, 1993 for review), issues of identity and intimacy are active in influencing the age spans of late adolescence and early adulthood. Additionally, with the results of this study suggesting that identity, in particular, has a significant effect on a student’s persistence at the institution and both identity and intimacy significantly affecting or being affected by other variables in the Institutional Integration model, it would be a much more informative approach to pursue the influences of these variables in further empirical investigations on undergraduate persistence. The weak predictiveness of the intimacy variable in this study may be due to the possibility of the two institutional subsamples being comprised of students who commute to school. As previously discussed, these students could be from a different population which may not address intimacy issues in the same ways or
seek the kinds of institutional mechanisms facilitating this aspect of development as students from the undergraduate residential population. Future studies must specifically examine these issues with samples drawn from these two populations to gain a further understanding of their potential differences and how they may affect models of undergraduate persistence.

Another approach to further assess the contribution of the developmental issues of identity and intimacy is to longitudinally examine the changing experiences and needs of students as they matriculate through the undergraduate institution. Specifically, there may be differences among freshman/sophomores and juniors/seniors in the factors that influence their perceptions and experiences at the undergraduate institution which may be more related to issues of establishing one's ego and career-role identities during the first two years of college while factors relating more to establishing interpersonal affiliation/trust may be more indicative of the latter years of the college experience. For example, incoming freshmen and sophomores may be more concerned with the "need" to become more autonomous and less reliant on the family in making career choices which may motivate them to seek and rely on more of the mechanisms that relate to academic and social integration. Upperclassmen, however, may be more preoccupied with issues relating to psychologically intimate affiliations with fellow peers or a type of intimate trust in the institution and its agents (ie, faculty and staff). Therefore, if such developmental variables as identity and intimacy are consistently implicated in the Institutional Integration model and other models of retention, then intervention can be made to be more specific and beneficial in assisting students in their handling of these issues, specifically, and, overall, in increasing their likelihood of continuing to pursue the undergraduate degree.
Limitations

This exploratory study has many areas that need to be strengthened. It would be advantageous to have a much larger sample of undergraduate students, particularly due to the matched nature of the sample. Although matching the sample by ethnicity (African American and European American) on a variety of student characteristics (ie, gender, academic major, age, class designation, socioeconomic status, and marital status) had the benefits of reducing pre-analysis variability, due to the complexity of the models involved, however, it may be better to simply collect a very large random sample, insuring that it is representative with respect to gender and ethnicity. A larger sample would allow for the examination of age differences, with respect to variables such as gender and intimacy, that were possibly obscured by the collapsed nature of this study and its goal of identifying main effects at the cost of other possible interaction effects. A larger sample would also serve to increase the statistical power of the study and possibly give a clearer answer to the question of significant ethnic differences in the variable “persistence in higher education”. Furthermore, more attention should be focused on assessing the "commuter student" versus "residential student" populations in the effort to more fully disentangle potentially confounding factors, implicated in studies of persistence, which are associated with these two populations.

Although there was a high degree of similarity between the regression-based results of the hypothesized path models and those of the correlation matrix-based analyses of the same model, a much more powerful and flexible analysis would be derived if future studies used the covariance structural modeling technique (ie, RAMONA, Browne and Mels, 1994). Such a technique has, particularly in this study,
exemplified its ability to more reliably, simultaneously estimate the effects of all the variables in the model predicting the two persistence criterion variables.

Future studies should also perform confirmatory factor analyses using the more complete Institutional Integration model (39 items), reported in Pascarella and Terenzini (1983), used in an exploratory fashion in this study. This is particularly critical because several of the factors derived were slightly different from the original factors reported in the factor analysis of an earlier study (Pascarella and Terenzini, 1980). This slightly different set of factors may have accounted for some of the differences in the findings of this study compared to those in the literature. Additionally, future studies need to reassess the reliability estimates of the derived factors of the model. A major psychometric question afflicting this study is the questionable reliability estimate of the factor-derived variable goal commitment. Such a poor reliability estimate may have contributed to the nonsignificant correlation between goal commitment and academic integration, a relationship that, according to other literature (ie, Williamson and Creamer, 1988; Pascarella and Terenzini, 1980, 1983), should exist. Although the reasoning of this lack of a significant relationship between these two variables is important to clearly determine, this finding in this study does not dramatically affect the overall results or interpretations.

Another needed point of further investigation in future studies is to explore whether the results based on the identity and/or intimacy scales used in this model are replicable and if other measures of identity and intimacy are equally, more, or less informative. The identity and intimacy scales used in this study were chosen because they captured the basic essence of identity and intimacy, as Erikson (1968) describes and were objective in nature, allowing for easy administration. The argument for the influence of these particular developmental variables would be even more compelling if
there is cross-validation from other identity/intimacy measures, including ethnic identity measures, used in this model.

Finally, it is very critical to attempt to replicate this study's findings using a longitudinal design. This is particularly important since undergraduate persistence is, inherently, a developmental phenomenon in which various factors within and exogenous to the Institutional Integration model may vary in their degree of influence on the persistence variables throughout the undergraduate student's matriculation through the undergraduate experience. This point is also critical when investigating the attrition/persistence influences of an undergraduate student in her first- and second-year versus her third- and fourth-year versus that of a nontraditional undergraduate student. This point highlights a clear flaw in this study in that the sample comprised students of all undergraduate classifications and thus the resulting models derived may not specifically apply to one group or another. There, indeed, may be entirely different models or strengths of influence within the Institutional Integration model concurring more specifically with the length of time the student spends at the institution.
### TABLE 1

**Factor Loadings and Reliability Estimates for Institutional Integration Variables**\(^{a,b}\)

<table>
<thead>
<tr>
<th>Variable and Item</th>
<th>Factor Loading</th>
<th>Percent of Variance</th>
<th>Alpha Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUALITY OF PEER RELATIONS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Since coming to this university, I have developed close personal relationships with other students.</td>
<td>78</td>
<td>19.8</td>
<td>.88</td>
</tr>
<tr>
<td>2) My interpersonal relationships with other students have had a positive influence on my intellectual growth and interest in ideas.</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) My interpersonal relationships with other students have had a positive influence on my personal growth, attitudes and values.</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Not many of the students I know would be willing to listen to me and help me if I had a personal problem.</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) The student friendships I have developed at this university have been personally satisfying.</td>
<td>77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) It has been difficult for me to meet and make friends with other students.</td>
<td>68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUMBER OF QUALITY INTERACTIONS</td>
<td></td>
<td>8.4</td>
<td>.82</td>
</tr>
<tr>
<td>1) Please rate the number of nonclass contacts with faculty of 10 minutes or more that you have had this current school year to socialize informally.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Please rate the number of nonclass contacts with faculty of 10 minutes or more that you have had this current school year to discuss a campus issue or problem.</td>
<td>68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Please rate the number of nonclass contacts with faculty of 10 minutes or more that you have had this current school year to help resolve a personal problem.</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Please rate the number of nonclass contacts with faculty of 10 minutes or more that you have had this current school year to get basic information and advice about your academic program.</td>
<td>77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Please rate the number of nonclass contacts with faculty of 10 minutes or more that you have had this current school year to discuss intellectual or course-related matters.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) Please rate the number of nonclass contacts with faculty of 10 minutes or more that you have had this current school year to discuss matters related to your future career.</td>
<td>73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 1 (continued)

<table>
<thead>
<tr>
<th>Variable and Item</th>
<th>Factor Loading</th>
<th>Percent of Variance</th>
<th>Alpha Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FACULTY CONCERN FOR STUDENT DEVELOPMENT AND TEACHING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Most faculty members I have had contact with are genuinely interested in teaching.</td>
<td>-.58</td>
<td>7.3</td>
<td>.79</td>
</tr>
<tr>
<td>2) Not many of the faculty members I have contact with are willing to spend time outside of class to discuss issues of interest and importance to students.</td>
<td>-.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Most of the faculty I have had contact with are interested in helping students grow in more than just academic areas.</td>
<td>-.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Not many of the faculty members I have had contact with are generally interested in students.</td>
<td>-.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Not many of the faculty members I have had contact are generally outstanding or superior teachers.</td>
<td>-.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GOAL COMMITMENT</strong></td>
<td></td>
<td>5.9</td>
<td>.54</td>
</tr>
<tr>
<td>1) I have no idea at all what I want to major in.</td>
<td>.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) It is important for me to graduate from college</td>
<td>.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) What is the lowest level of education that you would be satisfied with?</td>
<td>.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) How important is it for you to graduate from college?</td>
<td>.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PERSONAL AND INTELLECTUAL DEVELOPMENT THROUGH POSITIVE FACULTY INTERACTION</strong></td>
<td></td>
<td>4.6</td>
<td>.79</td>
</tr>
<tr>
<td>1) My nonclassroom interactions with faculty have had a positive influence on my intellectual development since enrolling in this university.</td>
<td>-.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) My nonclassroom interactions with faculty have had a positive influence on my career goals and aspirations.</td>
<td>-.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) My nonclassroom interactions with faculty have had a positive influence on my personal growth, values, and attitudes.</td>
<td>-.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SATISFACTION WITH THE INSTITUTION</strong></td>
<td></td>
<td>4.0</td>
<td>.71</td>
</tr>
<tr>
<td>1) I am satisfied with my academic experience at this university.</td>
<td>-.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) I am satisfied with the extent of my intellectual development since enrolling in this university.</td>
<td>-.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) I am confident that I made the right decision in choosing to attend this university.</td>
<td>-.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) In originally considering which college to attend, please circle how (name of institution) ranked as a choice in your original decision.</td>
<td>-.41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. a - item loadings reported are for a 6-factor solution with oblique rotation; b - Cronbach alpha estimate for “persistence at the institution” = .74; Cronbach alpha estimate for “persistence in higher education” = .79; c - item excluded from subsequent analyses in order to increase the variable's Cronbach alpha estimate.


<table>
<thead>
<tr>
<th>Variable and Item</th>
<th>Factor Loading</th>
<th>Percent of Variance</th>
<th>Alpha Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IDENTITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) I wonder what sort of person I really am.</td>
<td>.47</td>
<td>27.2</td>
<td>.84</td>
</tr>
<tr>
<td>2) I feel certain about what I should do with my life.</td>
<td>.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Most people seem to agree about what sort of person I am.</td>
<td>.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) I feel my way of life suits me.</td>
<td>.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) My worth is recognized by others.</td>
<td>.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) I feel that what I am doing in life is not really worthwhile.</td>
<td>.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) I feel I fit in well in the community in which I live.</td>
<td>.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8) I feel proud to be the sort of person I am.</td>
<td>.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9) People seem to see me very differently from the way I see myself.</td>
<td>.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) I feel left out.</td>
<td>.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11) People seem to disapprove of me.</td>
<td>.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12) I change my ideas about what I want from life.</td>
<td>.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13) I am unsure as to how people feel about me.</td>
<td>.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14) My feelings about myself change.</td>
<td>.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15) I feel embarrassed when people tell me about their personal problems.</td>
<td>.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INTIMACY</strong></td>
<td></td>
<td>23.5</td>
<td>.70</td>
</tr>
<tr>
<td>1) I feel that no one has ever known the real me.</td>
<td>.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) I have a feeling of complete &quot;togetherness&quot; with someone.</td>
<td>.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) I share my private thoughts with someone.</td>
<td>.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) I feel as though I am alone in the world.</td>
<td>.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Someone shares my joys and sorrows.</td>
<td>.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) I feel nobody really cares about me.</td>
<td>.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) I feel embarrassed when people tell me about their personal problems.</td>
<td>.43</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: a - item loadings reported for each variable are for a 1-factor solution; b - the Cronbach alpha estimate for the variable social desirability is .72; social desirability accounted for 14.7% of explained variance; c - despite its factor loading falling below the the cut-off of .40, this item was included in subsequent analyses because it substantially increased the Cronbach alpha estimate for the variable "intimacy".
TABLE 3

**Correlation Factor Structures of Significantly Different Path Relationships by Institution**

<table>
<thead>
<tr>
<th>PATH</th>
<th>Z-SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity ----&gt; Intimacy c</td>
<td>-2.41</td>
</tr>
<tr>
<td>Goal commitment ----&gt; Satisfaction with the Institution d</td>
<td>1.98</td>
</tr>
<tr>
<td>Satisfaction with the Institution ----&gt; Goal Commitment e</td>
<td>1.98</td>
</tr>
</tbody>
</table>

Note. a - z-scores ≥ +/- 1.96 for paths comparing institutional differences were considered significantly different and not used in the interpretation of the main body of analyses; b - formula used to derive z-scores of paths: \( \beta_1 - \beta_2 / (SE_1 + SE_2) ^{1/2} \); c - paths significantly different for hypotheses 1 and 3; d - path significantly different for hypothesis 1; e - path significantly different for hypothesis 3.
### TABLE 4

Overall Means for All Factor-derived Continuous Variables Used in Major Analyses

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Commitment</td>
<td>13.02</td>
<td>1.48</td>
<td>5.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Satisfaction with the Institution</td>
<td>13.12</td>
<td>3.17</td>
<td>5.0</td>
<td>19.0</td>
</tr>
<tr>
<td>Personal and Intellectual Development Through</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Faculty Interaction</td>
<td>8.92</td>
<td>2.46</td>
<td>3.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Faculty Concern for Student Development and Teaching</td>
<td>16.57</td>
<td>3.73</td>
<td>7.0</td>
<td>25.0</td>
</tr>
<tr>
<td>Number of Quality Interactions</td>
<td>10.88</td>
<td>4.24</td>
<td>6.0</td>
<td>28.0</td>
</tr>
<tr>
<td>Quality of Peer Relations</td>
<td>22.08</td>
<td>5.11</td>
<td>6.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Identity</td>
<td>39.90</td>
<td>5.42</td>
<td>24.0</td>
<td>52.0</td>
</tr>
<tr>
<td>Intimacy</td>
<td>8.94</td>
<td>2.13</td>
<td>4.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Persistence at the Institution</td>
<td>12.28</td>
<td>2.78</td>
<td>3.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Persistence in Higher Education</td>
<td>13.74</td>
<td>2.08</td>
<td>6.0</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Note. a - N=178; b - the background variables of "socioeconomic status", "ethnicity", and "gender" were categorical and not included in this descriptive analysis; c - these variables were combined together to produce the variable "academic integration"; d - these variables were combined together to produce the variable "social integration".
### TABLE 5

**Intercorrelations of All Major Variables**<sup>a,b,c</sup>

<table>
<thead>
<tr>
<th></th>
<th>ID</th>
<th>INT</th>
<th>SD</th>
<th>GC</th>
<th>PHE</th>
<th>PAI</th>
<th>ACD</th>
<th>SOC</th>
<th>SAT</th>
<th>SES</th>
<th>ETH</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>----</td>
<td>----</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>INT</td>
<td>.47*</td>
<td>----</td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>SD</td>
<td>.37*</td>
<td>.22*</td>
<td>----</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GC</td>
<td>.27*</td>
<td>.09</td>
<td>.20*</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHE</td>
<td>.27*</td>
<td>.24*</td>
<td>.13</td>
<td>.31*</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAI</td>
<td>.26*</td>
<td>.19#</td>
<td>.07</td>
<td>.38*</td>
<td>.39*</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACD</td>
<td>.27*</td>
<td>.19#</td>
<td>.18#</td>
<td>.06</td>
<td>.01</td>
<td>.18#</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOC</td>
<td>.24*</td>
<td>.21*</td>
<td>.08</td>
<td>.24*</td>
<td>.16#</td>
<td>.16#</td>
<td>.34*</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td>.28*</td>
<td>.23*</td>
<td>.06</td>
<td>.23*</td>
<td>.18#</td>
<td>.48*</td>
<td>.35*</td>
<td>.33*</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>-.03</td>
<td>.09</td>
<td>-.08</td>
<td>.08</td>
<td>.07</td>
<td>.18#</td>
<td>-.02</td>
<td>0.0</td>
<td>.06</td>
<td>----</td>
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<tr>
<td>ETH</td>
<td>-.09</td>
<td>.15#</td>
<td>-.06</td>
<td>.02</td>
<td>.17#</td>
<td>.05</td>
<td>-.04</td>
<td>.01</td>
<td>.23*</td>
<td>.15#</td>
<td>----</td>
</tr>
<tr>
<td>GEN</td>
<td>.06</td>
<td>-.10</td>
<td>-.08</td>
<td>-.06</td>
<td>-.05</td>
<td>.09</td>
<td>.05</td>
<td>.09</td>
<td>.11</td>
<td>.04</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Note. a - ID = identity, INT = intimacy, SD = social desirability, GC = goal commitment, PHE = persistence in higher education, PAI = persistence at the institution, ACD = academic integration, SOC = social integration, SAT = satisfaction with the institution, SES = socioeconomic status, ETH = ethnicity, GEN = gender; b - * = p<.01, # = p<.05; c - the categorical variable of ethnicity was coded “0” (African American) and “1” (European American), the categorical variable of gender was coded “0” (female) and “1” (male).
TABLE 6

Regression-Based Estimates for Significant Paths in Hypothesis 1a,b

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Predictors</th>
<th>beta</th>
<th>SE beta</th>
<th>Partial r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intimacy</td>
<td>Identity</td>
<td>.44f</td>
<td>.08</td>
<td>.42</td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
<td>.24</td>
<td>.08</td>
<td>.27</td>
</tr>
<tr>
<td>Goal Commitmentc</td>
<td>Identity</td>
<td>.24</td>
<td>.09</td>
<td>.26</td>
</tr>
<tr>
<td>Satisfaction with the Institutiond</td>
<td>Goal Commitment</td>
<td>.31f</td>
<td>.08</td>
<td>.30</td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
<td>.21d</td>
<td>.08</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>Intimacy</td>
<td>.19d</td>
<td>.08</td>
<td>.18</td>
</tr>
<tr>
<td>Persistence at the Institution</td>
<td>Satisfaction with the Institution</td>
<td>.51c</td>
<td>.07</td>
<td>.51</td>
</tr>
</tbody>
</table>

Note. a - only significant path estimates are reported; b - “social desirability” used as a covariate in all equations with “identity” and/or “intimacy” as predictors; c - p≤.01; d - p≤.05; e - regression equation controlled for the effects of the background variables (see figure 5); f - preliminary analyses revealed significant differences between the institutional subsamples for this path making interpretations of this path estimate tenuous.
### TABLE 7

Regression-Based Estimates for Significant Paths in Hypotheses 2 and 4<sup>a</sup>

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Criterion</th>
<th>Predictors</th>
<th>beta</th>
<th>SE beta</th>
<th>Partial r</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Persistence at the Institution</td>
<td>Academic integration</td>
<td>.18&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.08</td>
<td>.17</td>
</tr>
<tr>
<td>2</td>
<td>Social Integration</td>
<td>Academic integration</td>
<td>.35&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.07</td>
<td>.35</td>
</tr>
<tr>
<td>4</td>
<td>Social integration</td>
<td>Academic integration</td>
<td>.35&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.07</td>
<td>.35</td>
</tr>
</tbody>
</table>

Note: a - only significant path estimates are reported, b - p ≤ .01; c - p ≤ .05;
TABLE 8

Regression-Based Estimates for Significant Paths in Hypothesis 3a,b

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Predictors</th>
<th>beta</th>
<th>SE beta</th>
<th>Partial r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Commitment</td>
<td>Satisfaction with</td>
<td>.29c</td>
<td>.08</td>
<td>.29</td>
</tr>
<tr>
<td></td>
<td>the Institution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persistence in Higher Education</td>
<td>Goal Commitment</td>
<td>.23c</td>
<td>.08</td>
<td>.23</td>
</tr>
<tr>
<td></td>
<td>Identity</td>
<td>.25c</td>
<td>.09</td>
<td>.23</td>
</tr>
</tbody>
</table>

Note. a - only significant path estimates reported here are those that are unique to hypothesis 3; all of the other significant paths may be found in table 6 (for hypothesis 1); b - "social desirability" used as a covariate in all equation with "identity" as a predictor; c - p≤.01
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>Point Estimate</th>
<th>Std. Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethnicity --&gt; Intimacy</td>
<td>.19</td>
<td>.06</td>
<td>2.99</td>
</tr>
<tr>
<td></td>
<td>Identity --&gt; Goal Commitment</td>
<td>.23</td>
<td>.07</td>
<td>4.10</td>
</tr>
<tr>
<td></td>
<td>Ethnicity --&gt; SAT&lt;sub&gt;d&lt;/sub&gt;</td>
<td>.20</td>
<td>.07</td>
<td>2.88</td>
</tr>
<tr>
<td></td>
<td>Intimacy --&gt; SAT&lt;sup&gt;f&lt;/sup&gt;</td>
<td>.19</td>
<td>.07</td>
<td>2.73</td>
</tr>
<tr>
<td></td>
<td>SAT --&gt; PAI&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.48</td>
<td>.07</td>
<td>8.90</td>
</tr>
<tr>
<td>2</td>
<td>ACD --&gt; SOC&lt;sup&gt;f&lt;/sup&gt;</td>
<td>.34</td>
<td>.07</td>
<td>5.18</td>
</tr>
<tr>
<td>3&lt;sup&gt;g&lt;/sup&gt;</td>
<td>Goal Commitment --&gt; PHE&lt;sup&gt;h&lt;/sup&gt;</td>
<td>.25</td>
<td>.07</td>
<td>3.59</td>
</tr>
<tr>
<td></td>
<td>Identity --&gt; PHE&lt;sup&gt;h&lt;/sup&gt;</td>
<td>.20</td>
<td>.07</td>
<td>2.82</td>
</tr>
<tr>
<td>4</td>
<td>SOC --&gt; ACD&lt;sup&gt;f&lt;/sup&gt;</td>
<td>.34</td>
<td>.07</td>
<td>5.18</td>
</tr>
</tbody>
</table>

Note. a - Only significant paths of one-tailed t-tests at p ≤ .05 are included; b - significant paths for identity and intimacy (hypotheses 1 and 3) are not included due to preliminary analyses revealing significant differences between the institutional subsamples making interpretations of this path estimate tenuous; c - significant paths for "satisfaction with the institution" and "goal commitment" (hypotheses 1 and 3) are not included due to preliminary analyses revealing significant differences between the institutional subsamples making interpretations of this path estimate tenuous; d - SAT = "satisfaction with the institution"; e - PAI = "persistence at the institution"; f - ACD = academic integration; SOC = social integration; g - only reporting significant paths unique to hypothesis 3; all other applicable significant paths can be found under those reported in hypothesis 1; h - PHE = "persistence in higher education".
FIGURE 1. Proposed Path Model for Hypothesis 1
FIGURE 2. Proposed Path Models for Hypotheses 2 and 4

Note. a - top path model applies to hypothesis 2 and bottom path model applies to hypothesis 4
FIGURE 3. Proposed Path Model for Hypothesis 3
FIGURE 4. Regression-based Path Model of Hypothesis 1

Note. a - dashed lines indicate nonsignificant hypothesized path relationships.
FIGURE 5. Regression-based Path Model of Hypotheses 2 and 4a,b.

Note: a - top path model applies to hypothesis 2 and bottom path model applies to hypothesis 4; b - dashed lines indicate nonsignificant hypothesized path relationships.
FIGURE 6. Regression-based Path Model of Hypothesis 3\,\textsuperscript{a,b}

Note. a - dashed lines indicate nonsignificant hypothesized path relationships; b - dashed lines indicate nonsignificant hypothesized path relationships.
FIGURE 7  Post-hoc Point Estimates of Path Model Predicting Persistence at the Institution\textsuperscript{a}

Note. a - standard errors of all point estimates ranged between .06 and .07.
FIGURE 8. Post-hoc Point Estimates of Path Model Predicting Persistence in Higher Education

Note. a - standard errors of all point estimates ranged between .06 and .07.
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