

CAREER DECISION-MAKING SELF-EFFICACY AND INSTITUTIONAL INTEGRATION OF UNDERPREPARED COLLEGE STUDENTS

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This investigation applied, as the theoretical base, a model of student persistence and departure (Tinto, 1987) to explore the nature of the relationship between career decision-making self-efficacy and integration. Career decision-making self-efficacy identifies students' perceived confidence (self-efficacy) in their ability to plan and execute vocationally relevant tasks in the educational environment. The sample comprised 418 underprepared students. Data were analyzed using correlation, analysis of variance, and multiple regression. There is an interrelationship between perceived career decision-making self-efficacy and integration (overall, social, and academic) for underprepared college students. The variance in students' integration can be explained by their career decision-making self-efficacy and by their initial goals and commitments. Career decision-making self-efficacy surpassed all other variables in explaining the variance in overall and academic integration. Based on these research results, career decision-making self-efficacy should be considered as a variable in future studies of integration, a longitudinal study should be conducted to determine the direct relationship of career decision-making self-efficacy to persistence and attrition, and if a relationship to persistence is found, then the rationale exists for the design and experimental testing of interventions aimed at increasing career decision-making self-efficacy.

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The social and intellectual development of students should be the goal of institutions of higher education (Tinto, 1975, 1986, 1987). When an institution reflects a genuine concern for students' social and intellectual development, retention of those students in that institution should follow. Thus, according to Tinto, retention is not the goal of the institution, but rather a desired outcome.

Retention of students evidently is a problem given alarmingly high attrition rates. It is estimated that 42 percent of students enrolled in community colleges and 46 percent of students enrolled in technical institutes will leave prior to

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graduating and will not pursue further education (Schwartz, 1990a). Of students in four-year institutions, 28 percent will leave higher education entirely, and only 14 percent of those who transfer and 6 percent of those who leave but return will eventually earn four-year degrees (Tinto, 1987).

Such attrition rates are particularly alarming for students who are underprepared for higher education. Underprepared students are those whose academic skill in reading, writing, or math is lacking or underdeveloped, or whose high school performance, for whatever reason, indicates lacking or underdeveloped skills. Regardless of whether the skill is underdeveloped or lacking, underprepared students are those who enter college with marginal academic credentials and are therefore at risk of attrition. According to the United States Department of Labor (1987), by the year 2000, technological advances and a shift to the service sector will reduce the need for unskilled workers and increase the need for workers with higher skill levels. At the same time, 80 percent of new entrants into the work force will be women, persons of color, and immigrants—nontraditional groups that historically have been educationally or economically disadvantaged and are identified as “at risk.” Thus, it is important that these students stay in school for economic reasons—development of skills necessary for future employment. But the need for continuation in higher education of this at-risk group of students may be greater still for social and philosophical reasons—their social and intellectual development (Tinto, 1989).

Recognizing the role of the institution in producing such an outcome, Tinto (1975, 1987) developed and refined a model to explain students’ decisions to persist in or depart from educational institutions. It is through their academic and social integration with the educational institution that the social and intellectual development of students is likely to occur, and students who are socially and academically integrated are likely to persist longer in the institution.

The extent to which social and academic integration impacts persistence and departure decisions differs for different students, as does the impact of various individual, family, and academic performance background characteristics (Fox, 1986; Pascarella and Chapman, 1983; Schwartz, 1990a, 1990b; Weidman, 1985). Since the variables interact, the magnitude and direction of the effect depend on the combination of variables that are salient for each student (Fox, 1986; Munro, 1981; Pascarella, Duby, and Iverson, 1983; Pascarella and Terenzini, 1980, 1983; Tinto, 1987; Weidman, 1984). Thus, institutional- and student-specific research has been called for to determine persistence patterns for nontraditional students, including those who are educationally underprepared and/or economically disadvantaged, and across various types of institutions.

Integration (social and academic) is not the only variable to be linked to persistence and attrition. There is evidence to support a relationship between career goal identification and persistence (Astin, 1975; Beal and Noel, 1980; Cope and Hannah, 1975; Frank and Kirk, 1975; Hanson and Taylor, 1970;

Hillary, 1978; Newlon and Gaither, 1980; Sprandel, 1986), and between declaration of a major and academic success (Foote, 1980). In addition, a relationship between career self-efficacy expectations and persistence has been established (Brown, Lent, and Larkin, 1989; Lent, Brown, and Larkin, 1984, 1986, 1987; Lent, Larkin, and Brown, 1989). Self-efficacy identifies areas in which individuals perceive certainty and uncertainty about their ability to plan and execute educational, occupational, and personal goals and objectives. Career self-efficacy identifies how students perceive their ability to perform vocationally relevant tasks in the educational setting (Betz and Hackett, 1981; Hackett and Betz, 1981).

Thus, research studies suggest a relationship between career planning and decision making and students' decisions to persist in or depart from their institutions. However, this relationship has not been established within a theoretical framework such as the Tinto (1975, 1987) model.

The purpose of this research was to explore the nature of the relationship between career decision-making self-efficacy and integration (overall, social, and academic) of underprepared college students within the framework of the Tinto (1975, 1987) theoretical model. The major questions addressed in this research were: (1) What is the relationship between students' perceived career decision-making self-efficacy and (a) their integration with the educational institution, and (b) their initial goals and commitments? (2) Do students' perceived career decision-making self-efficacy, initial goals and commitments, and integration differ, given their patterns of registration and other background characteristics? (3) Can students' perceived career decision-making self-efficacy, in addition to their background characteristics, pattern of registration, initial goals and commitments, and intention to persist, help to explain the variance in their integration?

If a relationship between career decision-making self-efficacy and integration can be identified, then the basis for exploring the relationship between career decision-making self-efficacy and persistence will be established. The presence of the relationship will provide the rationale for designing both classroom and nonclassroom interventions to increase career decision-making self-efficacy and for testing the impact of those interventions on persistence. Self-efficacy can be acquired, and thus altered, in four ways, three of which have implications for classroom and student services interventions: (1) performance—individuals tend to have confidence in their ability to perform tasks that they have already performed successfully; (2) vicarious modeling—observing others successfully performing a task increases individuals' expectations that they, too, can perform that task; and (3) verbal persuasion—having positive feedback and encouragement from others, particularly significant others (e.g., friend, teacher, spouse), increases individuals' beliefs that they can successfully complete a task. The results of this study on underprepared students may have implications for other populations as well.

LITERATURE REVIEW

The examination of the literature on self-efficacy is delimited to that which relates to career planning and decision making. The examination of the literature on student persistence focuses on the Tinto (1975, 1987) model and integration.

Self-Efficacy

Bandura (1977) defined self-efficacy expectations as beliefs about one's ability to successfully perform specific tasks indicative of certain behaviors. The strength of each efficacy expectation was hypothesized to determine whether that behavior would be initiated, how much effort would be expended, and how long that behavior would be maintained, particularly in the face of adverse conditions or obstacles. Later, Bandura (1986) recognized that an individual's level of self-efficacy interacted with other motivational aspects of the person's life, as well as personal capabilities and performance accomplishments. Low self-efficacy regarding a task/behavior leads to avoidance of that behavior, while high self-efficacy leads to initiating and maintaining the task/behavior.

Since strong self-efficacy expectations are crucial to the initiation and persistence of performance, two researchers recognized that the concept of self-efficacy might also be applicable to initiating behaviors to overcome career indecision. The initial application to career indecision was in the study of the career development of women (Hackett and Betz, 1981). The study resulted in the development of a model postulating that women lack strong self-efficacy regarding many career-related behaviors, particularly regarding male-dominated careers, and thus fail to realize their capabilities in career pursuits.

To test the model, Betz and Hackett (1981) introduced the concept of "occupational self-efficacy" to identify the impact of self-efficacy on career-related behaviors and career choices of women by predicting the range of their career options of occupational alternatives. Men had higher levels of self-efficacy for male-dominated occupations, and women had higher levels of self-efficacy for female-dominated occupations. Occupational self-efficacy, in combination with gender and measures of vocational interest, was significantly predictive of the range of occupational alternatives, although ability was not found to be significantly predictive. This study is consistent with the Elton and Rose (1971) study of males, which found no differences in personality or ability between undecided and decided students (in reference to choice of major) and suggested that students tend to choose occupations consistent with their personalities.

Betz and Hackett (1981) concluded that there are gender differences regarding specific gender-dominated careers, and although gender differences in self-efficacy are predictive of gender differences in specific occupational choices,

no overall self-efficacy differences were found between genders; the gender differences that emerged were with respect to traditional and nontraditional occupations.

The second investigation resulted in the development of the concept of career decision-making self-efficacy (Taylor and Betz, 1983), which was operationalized with the Career Decision-Making Self-Efficacy (CDMSE) scale. A moderately strong relationship ($r = .40$) was found between career decision-making self-efficacy and career indecision, such that students who are more confident in their ability to perform career decision-making tasks report less career indecision; there was little or no relationship between ability level and self-efficacy expectations; there was a high general factor of career decision-making self-efficacy; and the five task-specific subscales did not contribute individually to the analysis. This last conclusion suggests a more global interpretation of self-efficacy, contrary to Bandura's belief that self-efficacy is task-specific.

Taylor and Popma (1990) expanded the research on the relationship between career decision-making self-efficacy and vocational indecision by including the variables of career salience and locus of control. The purpose of the study was to further investigate the meaningfulness of the CDMSE as a more global (general) measure of career decision-making self-efficacy, and to replicate the original study (Taylor and Betz, 1983). Multiple regression analysis revealed that five independent variables—career decision-making self-efficacy, career salience, locus of control, occupational self-efficacy, and range of career options—accounted for 29 percent of the variance in vocational indecision, but only career decision-making self-efficacy made a significant contribution to the prediction of vocational indecision. Vocational indecision was based on the Osipow, Carney, Winer, Yanico, and Koschier (1980) Career Decision Scale (CDS) consisting of 18 items. The CDS resulted from the development of a scale of vocational indecision (Osipow, Carney, and Barak, 1976), the purpose of which was to serve as a criterion measure to assess the impact of vocational interventions on undecided students.

Deciding on a career and deciding on a college major both are represented in the CDS and appear to be related. According to Foote (1980), students who had determined their major were more likely to persist than those who were undetermined. However, most of the determined group did not persist, and the conclusion was drawn that for the 8 percent of the determined group who stayed in school more than two years, high school rank and ACT entrance scores were more related to persistence than major designation.

Beginning in 1984, a series of articles identified a relationship between career self-efficacy and academic performance and persistence (Lent, Brown, and Larkin, 1984, 1986, 1987; Brown, Lent, and Larkin, 1989; Lent, Larkin, and Brown, 1989). These studies were the first to link career self-efficacy and per-

sistence. Although the studies, based on three different (though small) samples, were specific to high ability, predominantly male freshmen enrolled in a science and engineering career planning course after being admitted to a highly selective unit of a large midwestern state university, the results are pertinent to the relationship between career decision-making and persistence. The major findings suggest that although there is no significant difference between men and women for self-efficacy scores, self-efficacy does contribute significantly to the prediction of grades, persistence, and range of career options considered; after removing for the variance in objective math ability, high school achievement, and vocational interest, self-efficacy still contributes significantly to the prediction of GPA and the number of quarters that students persist. Self-efficacy is moderately correlated with career decidedness, as measured by the Career Decision Scale (CDS); with self-esteem, as measured by the Self-Esteem Scale (SES); and with vocational interest, as measured by the Strong-Campbell Interest Inventory (SCII). Thus, career decision-making self-efficacy appears to have construct and discriminant validity. Career indecision and major determination and self-esteem are separate constructs from career decision-making self-efficacy.

Students scoring in the lower ranges of aptitude, but with high self-efficacy scores measuring more general efficacy perceptions, obtained significantly higher GPAs than those with lower self-efficacy perceptions. Students of lower aptitudes, but with high self-efficacy scores measuring general efficacy perceptions, persisted significantly longer (in terms of the number of subsequent quarters completed) than those with low self-efficacy scores. The GPA performance and persistence of high-aptitude students appears unrelated to self-efficacy scores measuring general efficacy perceptions; therefore, having a high degree of self-efficacy may be more crucial to grade attainment and persistence for lower-ability students than for higher-ability students.

Using meta-analysis across a wide range of subjects, experimental designs, and assessment methods, Multon, Brown, and Lent (1991) reported a positive and statistically significant relationship between self-efficacy beliefs and academic performance and persistence. Meta-analysis allows the researcher to combine findings from independent studies into a single estimate of the strength of hypothesized relationships to test the extent to which the studies collectively support or disconfirm those theoretical hypotheses. The correlation between self-efficacy and either performance ($r = .38$) or persistence ($r = .34$) suggested that self-efficacy beliefs accounted for approximately 14 percent of the variance in students' academic performance and approximately 12 percent of the variance in their academic persistence. However, there was also indication that the relationship varied across student types, measures, and study characteristics. For example, self-efficacy was found to be particularly facilitative for low-achieving students, although the way in which the data were collected in

the various studies (from pretests or from posttests) may have influenced those results. Nevertheless, given a reasonably comprehensive meta-analysis that confirms the hypothesis that self-efficacy does have a relationship with other academic variables, there is evidence to suggest the need for further research as to what might be those relationships.

Student Persistence and Attrition

Based on the Spady (1971) model, Tinto (1975, 1987) developed and refined a model to explain the process of interaction between an academic institution and its students. The model (Figure 1) takes into consideration students' preentry attributes, goals and commitments, institutional experiences (social integration and academic integration), and developed goals and commitments in contributing to their decisions to persist in or depart from the institution. The model is explained below.

- *Preentry attributes.* Students come to the institution with attributes reflecting their family background, individual skills and abilities, and prior schooling experiences. These variables are the students' background characteristics.
- *Goals and commitments.* Students also come with goals and commitments, representing their *initial* intentions and commitments to their goals and to their institution. Intentions identify the extent to which students link the goal of college completion with other goals. Commitments represent motivation and effort. "The higher the personal expectations for a degree or occupation, the greater the likelihood of remaining in college" (Tinto, 1975, p. 102).
- *Institutional experiences.* Tinto (1975, 1986, 1987, 1989) perceives academic and social institutional experiences as having the greatest impact on students in their decisions to persist or depart. Academic integration is represented by formal and informal situations regarding academic performance and interactions with faculty, and can be measured not only in terms of grade performance but also by intellectual development. Social integration, also represented by formal and informal situations, includes students' extracurricular activities, interactions with their peer groups, and interactions with faculty and administrators. Interaction with faculty increases not only students' social integration but also their academic integration. Thus, the extent and quality of institutional experiences determine the level of the students' perceived academic and social integration.
- *Goals and commitments.* Just as students' intentions and commitments previously impacted their sense of integration, the degree of integration (given time spent in the educational institution) now impacts their *developed* goals and commitments.

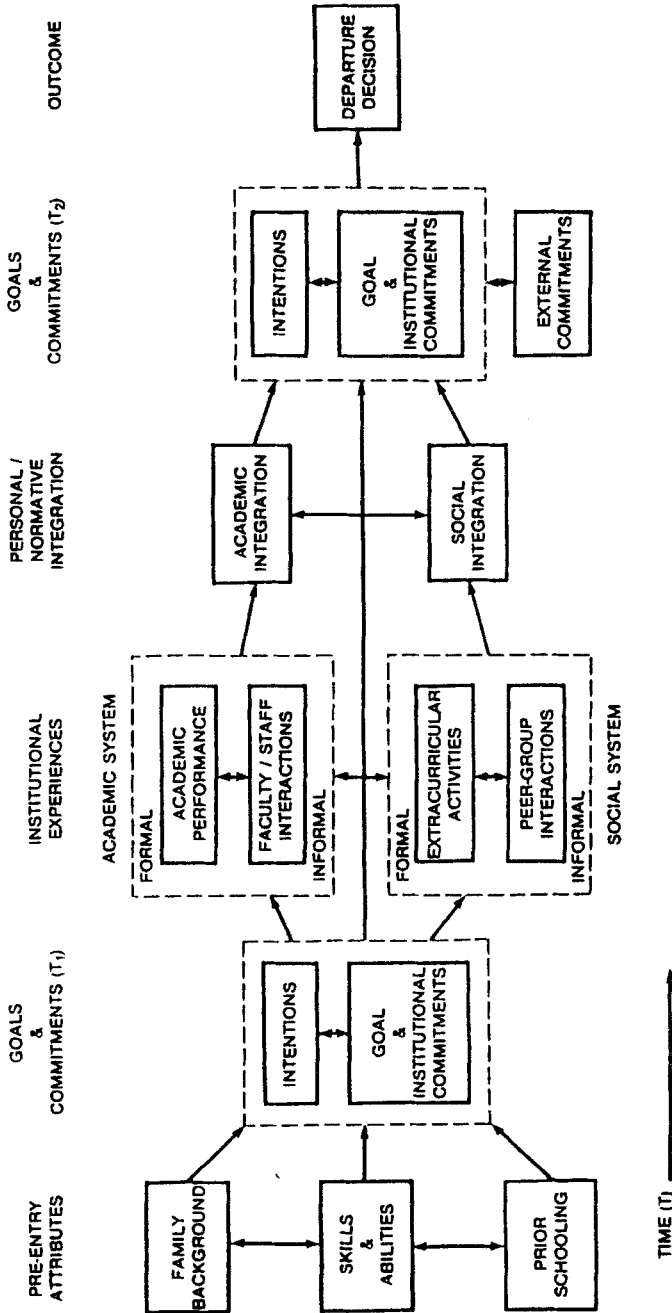


FIG. 1. A model of institutional departure.

- *Outcome.* Tinto's model concludes with the decision either to persist in or depart from the institution.

Although the model initially was operationalized in traditional college settings (Pascarella and Terenzini, 1983), it has since been tested with nontraditional populations including underprepared students (Fox, 1986; Schwartz, 1990a, 1990b; Weidman, 1985) and in less selective institutions (Pascarella, Duby, and Iverson, 1983). In addition, Garfield, delMas, and Dunham (1987), using traditional variables, predicted persistence and academic success of nontraditional students, finding background characteristics to be generally unimportant, but confirming the compensatory relationship between social and academic integration, and providing a rationale for including continuing students, in addition to first-quarter students, in studies of persistence and attrition.

Thus, the literature generally supports the Tinto (1975, 1987) model and the need to conduct institution-specific research on the persistence and attrition decisions of its students, including nontraditional students. Integration as a major component of persistence continues to be supported by research, indicating that social and academic integration differs for students with different background characteristics and institutional commitment. It may be that perceived career decision-making self-efficacy is an individual background characteristic related to the social and academic integration of underprepared students. Exploring the nature of that relationship was the focus of this study.

METHOD

Survey responses to two instruments were obtained from 418 students and data were analyzed using correlation, analysis of variance, and multiple regression.

Population and Sample

The population for this study comprised 1,549 academically underprepared, full-time students of the General College, a nondegree-granting unit of the University of Minnesota, a large, urban, commuter, doctoral-granting, public university. The mission of this college is to prepare students to transfer to degree-granting units within the university (the selectivity of which varies from unit to unit) or to transfer to a degree-granting program outside of the university. Many of these students are at risk of attrition for academic reasons and for economic reasons. General College students are academically underprepared, as indicated by high school grade point average, high school percentile rank, and ACT scores, and therefore at risk of attrition. In addition, about 25 percent of General College students tend to be disadvantaged economically—they are first-generation college students (neither parent attended college) or they are low income, or both.

A subsample of 678 students was identified according to their pattern of registration—consecutive, regular, or intermittent. Consecutive registrants had uninterrupted registration for one to five quarters, and comprised 72.0 percent of the sample; regular registrants had only one quarter of interruption in their registration and comprised 9.8 percent of the sample; and intermittent registrants had two or more quarters of interruption in their registration and comprised 18.2 percent of the sample. The rationale for this stratification is based on research showing that students who are integrated are more likely to persist in the educational environment. Thus, those students who have consecutively registered may be more integrated than those who have briefly left or those who have left for longer periods than one quarter. Stratifying the sample in this manner allowed first-quarter students, as well as those who had left but returned, to be surveyed.

The 418 respondents to the mail survey represented a 61.7 percent response rate. Of the 418 subjects, 47.7 percent were male and 52.3 percent were female, ranging in age from 18 to 48 (41.9 percent were 19–20 years old and 27.3 percent were 21–23 years old). Most of the students (69.2 percent) had jobs. The sample was predominantly Caucasian (70.3 percent), but also represented African American (12.6 percent), Asian (7.6 percent), Native American (5.0 percent), and Hispanic (4.5 percent) students. The demographics of the sample, including the 30 percent Students of Color representation, parallel the overall population of the college. Nearly one fourth of the sample had no high school rank, and 58.1 percent ranked below the 50th percentile. Their high school GPA also reflected unpreparedness, 45.7 percent having no GPA and 21.8 percent having a GPA below 2.0.

Instrumentation

Two instruments were administered: the Career Decision-Making Self-Efficacy instrument (Taylor and Betz, 1983) and the Fox (1986) revision of the Pascarella and Terenzini (1980, 1983) Institutional Integration Scale (IIS), which also incorporated students' initial goals and commitments. Self-reported background characteristics were collected with the IIS. Other background characteristics were obtained from college records.

The career decision-making self-efficacy instrument (CDMSE) entitled "Career Decision-Making Survey" comprised 10 tasks in each of five subscales—accurate self-appraisal, gathering occupational information, goal selection, making plans for the future, and problem solving. The CDMSE instrument (Taylor and Betz, 1983) has high internal reliability (.97), which was replicated in the present study, and has both concurrent and predictive validity (Taylor and Popma, 1990).

The Fox (1986) Institutional Integration Scale (IIS) entitled "Integration

Scale” was adapted for the present study by changing only the name of the institution, when it was mentioned, to the General College (GS) or the University of Minnesota (U of M), as appropriate. In addition, the item “Getting good grades was important to me,” taken from the Pascarella and Terenzini (1983) instrument, was added because it was deemed to be relevant to the population. The reliability analysis of the integration section of the IIS instrument used in the present study yielded high reliability coefficients—overall integration (.91), social integration (.83), and academic integration (.88). In previous research and in this research, the instrument has included items that reference students’ initial goals and commitments. Fox does not state separate reliability coefficients for the instrument, but Pascarella and Terenzini (1980), from whom the instrument was adapted, report reliability to be .71 for the institutional and goal commitment scale of the instrument. The alpha reliability of the initial goals and commitments section of the IIS used in the present study yielded a Cronbach’s coefficient alpha of .73.

Variable Specifications

The predictor (independent) variables included the following: career decision-making self-efficacy score (Scale A); initial goals and commitments (Scale B); intention to persist (IIS 36); and background characteristics. The criterion (dependent) variable is integration: overall integration (Scale C) that includes social integration (Scale D) and academic integration (Scale E). Each variable is discussed.

Career Decision-Making Self-Efficacy. The CDMSE identifies the extent to which students are confident (have self-efficacy) about their ability to engage in educational and occupational information-gathering and goal-planning activities. A single CDMSE continuous score was identified for each subject, as measured on a 10-point Likert scale, ranging from No Confidence (0) to Complete Confidence (9). The single score was derived by summing the score of each of 50 questions and computing the mean.

*Initial Goals and Commitments.*¹ The Initial Goals and Commitments scale (Scale B) identifies the degree to which students had academic goals and felt committed to their educations and institutions when they were first enrolled in the institution. The scale comprises a continuous score measured on a 5-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5), derived by summing the score of 11 items and computing the mean.

Intention. The intention variable is identified by a score from a single item on the IIS: “I expect to be enrolled at this university one year from today.” The score (IIS 36) was derived from a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5) by computing the mean.

Background Characteristics. Background characteristics included:

- Individual characteristics: employment, conditions (handicaps or disabilities), living arrangements (with or without parents), English-language proficiency, gender, age, degree aspiration, place of residence (proximity to the campus), ethnicity, state residency, number of courses registered for, number of courses completed, and pattern of registration.
- Family characteristics: financial aid, household income, parental education, and parental occupation.
- Precollege schooling: high school percentile rank and high school grade point average (GPA).
- Academic performance: University of Minnesota GPA and unit (General College) GPA.

*Integration.*² Overall integration (Scale C), one of the criterion (dependent) variables, is a combination of social integration (Scale D) and academic integration (Scale E). Each scale is based on a 5-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5). The social integration score (Scale D), which reflects students' relationships with their peers and also their perceptions of their nonclassroom personal relationships with faculty, was derived by summing the score of each of 10 items and computing the mean. The academic integration score (Scale E), which reflects students' perceptions of the quality of their faculty, classroom teaching, and facilities, and also takes into account out-of-classroom contact with faculty as that contact relates to academic or course-related information, was derived by summing the score of each of 14 items and computing the mean. The overall integration score was derived by summing the score of each of the 24 items (IIS 12-35) from scales D and E and computing the mean.

RESULTS AND DISCUSSION

There is a relationship between career decision-making and social and academic integration of underprepared students. The nature of that relationship is reflected by the results of the statistical analyses discussed below.

The Relationship

Simple product-moment correlation was used to answer the question, "What is the relationship between students' perceived career decision-making self-efficacy and (a) their integration with the educational institution, and (b) their initial goals and commitments?" The correlation coefficients of the continuous, dichotomous, and ordered variables and the intercorrelations among scores for each of the scales—career decision-making self-efficacy (Scale A), initial goals and commitments (Scale B), overall integration (Scale C), social integration (Scale D), and academic integration (Scale E)—are reported in Table 1. Also

TABLE 1. Means, Standard Deviations, Ranges, and Correlation Coefficients of the Continuous, Dichotomous, and Ordered Variables

	Standard			Correlation Coefficients				
	Mean	Deviation	Range	A	B	C	D	E
Intention to persist (IIS 36)	4.1	1.2	4.0	.21**	.26**	.30**	.23**	.31**
Age	22.3	4.8	30.0	.13**	.10*	.15**	.07	.19**
Employment	2.3	0.1	3.0	.09	-.11*	.02	-.00	.03
Application for financial aid	1.3	0.5	1.0	-.07	-.10*	-.07	-.05	-.07
Receipt of financial aid	1.4	0.5	1.0	-.05	-.08	-.09	-.07	-.10*
Courses attempted	9.4	8.3	64.0	-.06	-.13**	-.02	.04	-.07
Courses completed	7.1	5.8	35.0	-.06	-.12*	.02	.07	-.02
Proximity to campus	2.1	1.0	3.0	.00	-.01	-.06	-.10*	-.03
Minnesota residency	1.1	0.4	1.0	.07	.08	.08	.12*	.04
U of M GPA	2.3	1.1	4.0	-.00	-.03	.08	.04	.10*
Language proficiency	1.1	0.4	2.0	-.07	-.03	-.04	.02	-.07
Sex	1.5	0.5	1.0	-.06	.01	-.01	.02	-.04
GC GPA	2.2	1.2	4.0	-.03	-.04	.07	.06	.08
High school rank	28.2	22.7	97.0	-.05	-.03	-.07	-.06	-.07
HS GPA	1.1	1.1	4.0	-.02	.08	.06	.01	.08
Career Decision-Making Self-Efficacy (Scale A)	6.4	1.4	7.3	1.00	.35***	.42***	.34***	.42***
Initial Goals and Commitments (Scale B)	3.9	0.5	3.3		1.00	.41***	.35***	.38***
Overall Integration (Scale C)	3.5	0.6	3.5			1.00	.88***	.93***
Social Integration (Scale D)	3.2	0.7	3.9				1.00	.65***
Academic Integration (Scale E)	3.7	0.6	3.7					1.00

* = $p \leq .05$; ** = $p \leq .01$; *** = $p \leq .001$

reported in Table 1 are the means, standard deviations, and ranges.

The intercorrelations among scores were moderate and significantly different from zero ($p = .000$). Career decision-making self-efficacy (Scale A) was moderately correlated (.35) with goals and commitments (Scale B), and moderately correlated (.42) with overall integration (Scale C). However, career deci-

sion-making self-efficacy had a stronger relationship with academic integration (.42) than with social integration (.34). The moderate relationship reflects the discriminant validity of the construct, "career decision-making self-efficacy." It can be said that career decision-making self-efficacy explains about 12 percent of the variance in social integration and about 18 percent of the variance in overall integration and academic integration, as will be confirmed with the regression analysis.

Goals and commitments (Scale B) were moderately correlated with overall integration (.41), with social integration (.35), and with academic integration (.38), similar to the relationship between career decision-making self-efficacy and integration, and reflecting the discriminant validity of the construct, "goals and commitments."

Social integration (Scale D) and academic integration (Scale E) had a rather strong correlation of .65, which is to be expected since they are related constructs, both part of overall integration. Each score accounts for approximately 42 percent of the other; that is, there is an overlap of 42 percent in the two constructs.

Of the 15 continuous, dichotomous, and ordered background characteristics variables, 10 were found to be significantly correlated with at least one of the scores on the scales A through E. Those 10 variables were intention to persist (IIS 36), age, employment, application for financial aid, receipt of financial aid, proximity to campus, Minnesota residency, U of M grade point average (GPA), number of courses attempted, and number of courses completed.

Only intention to persist was significantly correlated with scores on each of the scales, but the correlations were slight to moderate (.21, .26, .30, .23, and .31, respectively). Age was positively correlated with the scores on each of the scales except social integration, but again the correlations were slight (.13, .10, .15, and .19, respectively). The other eight background characteristics variables were not correlated with either career decision-making self-efficacy (Scale A) or initial goals and commitments (Scale B), nor were they correlated with more than one of the integration scales (Scale C-E) and those correlations ranged only from .10 to .13. The five variables found not to be correlated with any of the scales were gender, high school rank, English-language proficiency, unit GPA, and high school GPA.

The relationship—based on the intercorrelations between perceived career decision-making self-efficacy and overall integration (A/C), between perceived career decision-making self-efficacy and social integration (A/D), and between perceived career decision-making self-efficacy and academic integration (A/E)—*within* each of the background variables also was examined. Those intercorrelations can be compared to the overall intercorrelations of .42 for A/C, .34 for A/D, and .42 for A/E. The highest intercorrelations between scores on the three scales occurred for students based on their age, gender, race, employment status, degree aspirations, and registration pattern.

The older the student, the stronger the intercorrelation between career decision-making self-efficacy and social, academic, and overall integration. For each of the age groups, the intercorrelations were significant at the .01 level except age 18, for which the intercorrelations were significant at the .05 level. At age 18, the moderate intercorrelations were lower (.33, .31, and .32) than was the overall intercorrelation. At ages 31–48, the correlations were higher and stronger (.63, .57, and .58).

There was a significant ($p \leq .01$) intercorrelation between career decision-making self-efficacy and integration for both genders, but the correlation was higher for females than males. For women, the relationship between career decision-making self-efficacy and integration was slightly greater (.49, .41, and .47) than the overall relationship (.42, .34, and .42). For men, the relationship was less (.34, .26, and .36).

For each ethnic/racial group, the intercorrelations between career decision-making self-efficacy and overall integration and academic integration were significant ($p \leq .05$), as was the case for social integration for each group except Hispanic students, for whom the relationship with career decision-making self-efficacy was not significant. The relationship between career decision-making self-efficacy and integration was moderate for Caucasian students (.37, .31, and .37) and African American students (.41, .37, and .37), although lower than the overall intercorrelations (.42, .34, and .42), while the correlations were higher and stronger for Native American students (.57, .61, and .53) and Asian students (.62, .58, and .56). For Hispanic students, the relationship was strong between career decision-making self-efficacy and overall integration and between career decision-making self-efficacy and academic integration, but only moderate between career decision-making self-efficacy and social integration (.61, .38, and .69).

Students who were not employed perceived a significant ($p \leq .01$) and strong relationship between career decision-making self-efficacy and integration (.55, .47, and .54) compared to the moderate correlation found in the overall relationship (.42, .34, and .42). Notable was the negligible relationship (.01, .01, .01) between the scores for students who were employed over 30 hours per week.

High intercorrelations also were obtained for students based on their degree aspirations: except for the few students ($N = 4$) who aspired to a two-year college degree (.96, .87, and .97), the highest intercorrelations were obtained for students who did not know their degree aspirations (.68, .41, and .78).

Students who had consecutively registered for two or four quarters perceived a relationship between career decision-making self-efficacy and integration that closely paralleled the overall relationship. The only group of students for whom there were no significant relationships between career decision-making self-efficacy and integration were those who had one interruption in their registration (for whom also the correlations were slight or negligible—.13, .06, and .16). First-quarter students also perceived a slight relationship between career

TABLE 2. *P-values from Analysis of Variance Using Background Characteristics as the Independent Variables and Scales A–E as the Dependent Variables

	A	B	C	D	E
Scale A = Career Decision-Making Self-Efficacy					
Scale B = Initial Goals and Commitments					
Scale C = Overall Integration					
Scale D = Social Integration					
Scale E = Academic Integration					
Background Variables:					
Degree aspiration	.000	.000	.001	.011	.001
GC GPA	.007	.014	.000		.000
U of M GPA	.027	.043	.004		.000
Age	.035		.001		.000
Living arrangements		.001	.016	.002	
Disabilities		.002	.037		.008
Father's occupation	.043				.055
Registration pattern	.046	.013			
Ethnicity	.000				
Mother's education	.001				
Mother's occupation	.008				
Father's education	.038				
Courses attempted		.024			
Application financial aid		.035			
Minnesota residency				.016	
Receipt of financial aid					.046
English proficiency					
Courses completed					
Employment					
Gender					
High school rank					
Household income					
High school GPA					
Proximity to campus					

*Only $p \leq .05$ reported

decision-making self-efficacy and integration (.20, .14, and .23), but the inter-correlation A/D was not significant. Moderate to strong relationships were perceived by students who continued to persist but had more than one interruption in their registration (.53, .43, and .54) and also by students who had registered for five consecutive quarters (.56, .56, and .53).

Differences Among Students Based on Background Characteristics

One-way analysis of variance (ANOVA) was performed for each of the background characteristics variables to answer the question, "Do students' per-

ceived career decision-making self-efficacy, initial goals and commitments, and integration differ, given their patterns of registration and other background characteristics?"

The *p*-values for the background characteristics variables in order of their significant group differences relevant to career decision-making self-efficacy (Scale A) are presented in Table 2. Only degree aspiration was found to have significant group differences for each of the scales. Generally, the higher the degree aspirations, the higher were the perceived career decision-making self-efficacy, initial goals and commitments, overall integration, social integration, and academic integration. This finding is consistent with the research that identifies degree aspirations as being reflective of high initial goals and commitments and indirectly contributing to persistence (Tinto, 1975, 1987; Pascarella and Terenzini, 1980; Terenzini, Lorang, and Pascarella, 1981; Pascarella, Duby, and Iverson, 1983). However, these results (though reflective of integration, not persistence) are inconsistent with the research results of Garfield, delMas, and Dunham (1987).

Other background characteristics variables for which there were significant group differences to one or more scales were ethnicity, mother's education, General College (GC) grade-point average (GPA), mother's occupation, University of Minnesota (U of M) GPA, age, father's education, father's occupation, registration pattern, living arrangements, conditions (handicaps/disabilities), Minnesota residency, number of courses attempted, application for financial aid, and receipt of financial aid.

According to the literature, grade point average (GPA) is reflective of students' *academic* integration (Fox, 1986; Munro, 1981; Pascarella, Duby, and Iverson, 1983; Schwartz, 1990b). Thus, it might be expected that when students were grouped on the basis of their GPA, differences would emerge in their integration scores. In this study, students with the highest General College (GC) and overall university GPAs did report the highest overall and academic integration, as well as the highest career decision-making self-efficacy and initial goals and commitments. Conversely, students with lower GC and university GPAs reported lower scores on the career decision-making self-efficacy, initial goals and commitments, and integration scales. However, when students were grouped according to their GPAs, there were no significant differences in their social integration.

According to the literature, students who are socially and academically integrated are more likely to persist (Pascarella, Duby, and Iverson, 1983; Schwartz, 1990b; Voorhees, 1987). Thus, it might be expected that students who had more consecutive or consistent registration patterns, as opposed to those whose registration was more intermittent, would be more highly integrated. Contrary to expectations, when students were grouped according to their registration pattern, the analysis of variance (ANOVA) revealed no significant differences in their overall, social, or academic integration scores. However,

when students were grouped according to their registration pattern, there were significant differences in their career decision-making, self-efficacy scores (Scale A) and their initial goals and commitments scores (Scale B). Students with the highest scores in career decision-making self-efficacy were first-quarter entering students and those who had registered for four consecutive quarters; those with the highest initial goals and commitments also were first-quarter entering students and those who had registered for two consecutive quarters.

Although there were some differences, the finding that background characteristics, for the most part, were not important in most of the statistical analyses is consistent with previous research that shows background characteristics not to be strong contributors to persistence and attrition (Fox, 1986; Getzlaf, et al., 1984; Schwartz, 1990b). The variables for which there were no significant *p*-values, indicating no significant group differences for any of the scales, were English proficiency, number of courses completed, employment, gender, household income, proximity to campus, and both of the precollege schooling variables (high school rank and high school GPA). The results of the analysis of variance, however, are of interest in their contribution to the understanding of the constructs career decision-making self-efficacy, goals and commitments, and integration (Peterson, In press).

Explanation of the Variance in Integration

Multiple regression was used to answer the question, "Can students' perceived career decision-making self-efficacy, in addition to their background characteristics, pattern of registration, initial goals and commitments, and intention to persist, help to explain the variance in their integration?" Entered into the regression equation separately as the criterion (dependent) variable were overall integration, social integration, and academic integration. Entered as the predictor (independent) variables were 12 variables: the continuous variables (career decision-making self-efficacy, initial goals and commitments, and intention to persist) and the significant background characteristics variables (based on the analysis of variance), which were receipt of financial aid, Minnesota residency, U of M GPA, GC GPA, age, and four categorical variables, which were dummy coded to comprise 18 variables: degree aspiration (5), living arrangements (5), father's occupation (7), and conditions (1).

The regression analyses³ (Tables 3 and 4) suggest that the variance in students' overall, social, and academic integration scores on the Institutional Integration Scale (IIS) can be explained primarily by their score on the Career Decision-Making Self-Efficacy (CDMSE) scale (Scale A) and by their score on the Initial Goals and Commitments scale (Scale B).

Overall Integration

The results of the regression analysis with overall integration as the depen-

dent variable are presented in Table 3. The 12 (26 with dummy coding) variables combined—career decision-making self-efficacy, initial goals and commitments, intention to persist, GC GPA, U of M GPA, receipt of financial aid, degree aspiration, age, father's occupation, living arrangements, conditions, and Minnesota residency—were highly significant ($p \leq .0000$) and explain 30.0 percent of the variance in the overall integration score.

Four of the variables emerged as making a significant contribution to the explanation of the variance in overall integration: career decision-making self-efficacy contributed 17.4 percent; together with initial goals and commitments, which added 7.8 percent to the explanation, the two variables improved the explanation of the variance to 25.2 percent. Intention to persist added another 2.6 percent, and U of M GPA added .1 percent to the explanation.

The R^2 statistic identifies the contribution of the variables in relation to the other variables entered into the equation. It is the beta scores that identify the individual, unique contribution made by each of the variables. The beta and t -scores are presented in Table 4. The highest beta score was obtained for career decision-making self-efficacy (.42), followed by initial goals and commitments (.30). Intention to persist and U of M GPA also emerged as statistically significant, but with beta scores of .17 ($p \leq .0002$) and .09 ($p \leq .0261$), respectively. The beta scores suggest that the model can be used with only two of the variables—career decision-making self-efficacy and initial goals and commitments—to explain the variance in overall integration.

Social Integration

The results of the regression analysis explaining the variance in social integration also are presented in Table 3. The 12 (26 with dummy coding) variables combined were highly significant ($p \leq .0000$) and explain 21.4 percent of the variance in the social integration score. Five of the variables emerged as making a significant contribution to the explanation of the variance in social integration: initial goals and commitments contributed 12.2 percent; together with career decision-making self-efficacy, which added 5.4 percent to the explanation, the two variables improved the explanation to 17.6 percent. Intention to persist added another 1.2 percent; being a Minnesota resident added another .9 percent; and aspiring to vocational, trade, or business school certificate added another .9 percent.

The highest beta score (Table 4) was obtained for initial goals and commitments (.35), followed by career decision-making self-efficacy (.25). Intention to persist, Minnesota residency, and degree aspiration emerged as significant, but only at the $p \leq .05$ level. The beta scores suggest that the model can be used with only two variables—initial goals and commitments and career decision-making self-efficacy—to explain the variance in social integration.

Academic Integration

The results of the regression analysis explaining the variance in academic integration also are presented in Table 3. The 12 (26 with dummy coding) variables combined were highly significant ($p \leq .0000$) and explain 30.4 percent of the variance in the overall integration score. Six of the variables emerged as making a significant contribution to the explanation of the variance in academic integration: career decision-making self-efficacy contributed 17.5 percent; together with initial goals and commitments, which added 6.6 percent to the explanation, the two variables improved the explanation to 24.1 percent. Intention to persist added another 3.2 percent, age added 1.5 percent, and U of M GPA added another 1.0 percent.

The highest beta scores (Table 4) were obtained for career decision-making self-efficacy (.42), followed by initial goals and commitments (.27). Intention to persist (.19), age (.12), and U of M GPA (.10) also emerged as significant. The beta scores suggest that the model can be used with only two variables—career decision-making self-efficacy and initial goals and commitments—to explain the variance in academic integration.

Thus, based on the results of the multiple regression analysis, the variance in students' overall, social, and academic integration can be explained primarily by their perceived career decision-making self-efficacy and by their initial goals and commitments. Career decision-making self-efficacy contributes to the explanation of more than half of the variance of overall and academic integration explained by all of the significant variables, followed by initial goals and commitments. Career decision-making self-efficacy is second to initial goals and commitments in explaining the variance in social integration. Also contributing to the explanation of the variance in integration (overall, social, and academic) were intention to persist and a few other background variables, but the increase in R^2 was negligible. This finding is consistent with the Tinto (1975, 1987) model and research that supports the contribution of initial goals and commitments to persistence (Tinto, 1975, 1987; Pascarella and Terenzini, 1980; Terenzini, Lorang, and Pascarella, 1981; Pascarella, Duby, and Iverson, 1983). This finding also is consistent the research that identified career self-efficacy as contributing to the persistence of high-ability students (Brown, Lent, and Larkin, 1989; Lent, Brown, and Larkin, 1984, 1986, 1987; Lent, Larkin, and Brown, 1989).

Although the regression analyses suggest that 30 percent of the variance in overall and academic integration and 21 percent of the variance in social integration can be explained primarily by career decision-making self-efficacy and initial goals and commitments, caution should be exercised in interpreting these results since most of the variance remains unexplained, and the extent to which these variables explain persistence remains to be seen. Other studies, however,

TABLE 3. Stepwise Regression Analysis for Overall, Social, and Academic Integration

Independent Variables = all significant, continuous, dichotomous, ordered, and categorical (dummy coded) variables;

Dependent Variable = Overall Integration (Scale C)

	<i>F</i>	<i>p</i>	Multi <i>R</i>	<i>R</i> ²	Inc
All 12 variables	14.09	.0000	.55	.30	
CDMSE (Scale A)	85.15	.0000	.42	.17	
Goals & comm (Scale B)	68.10	.0000	.50	.25	.08
Intention (IIS 36)	51.59	.0000	.53	.28	.03
U of M GPA	40.32	.0000	.54	.29	.01
Dependent Variable = Social Integration (Scale D)					
All 12 variables	8.95	.0000	.46	.21	
Goals & comm (Scale B)	56.18	.0000	.35	.12	
CDMSE (Scale A)	43.18	.0000	.42	.18	.06
Intention (IIS 36)	31.15	.0000	.43	.19	.01
MN residency	24.69	.0000	.44	.20	.01
Degree aspiration	20.82	.0000	.45	.21	.01
Dependent Variable = Academic Integration (Scale E)					
All 12 variables	14.37	.0000	.55	.30	
CDMSE (Scale A)	85.90	.0000	.42	.18	
Goals & comm (Scale B)	64.27	.0000	.49	.24	.06
Intention (IIS 36)	50.47	.0000	.52	.27	.03
Age	40.60	.0000	.54	.29	.02
U of M GPA	34.00	.0000	.55	.30	.01

TABLE 4. Beta and *t*-scores for Overall, Social, and Academic Integration

Dependent Variable = Overall Integration (Scale C)

	Beta	<i>t</i>	<i>p</i>
CDMSE (Scale A)	.42	9.23	.0000
Goals & comm (Scale B)	.30	6.51	.0000
Intention (IIS 36)	.17	3.76	.0002
U of M GPA	.09	2.23	.0261
Dependent Variable = Social Integration (Scale D)			
Goals & comm (Scale B)	0.35	7.50	.0000
CDMSE (Scale A)	0.25	5.16	.0000
Intention (IIS 36)	0.11	2.45	.0146
MN residency	-1.0	-2.12	.0346
Degree aspiration	0.09	2.12	.0350
Dependent Variable = Academic Integration (Scale E)			
CDMSE (Scale A)	.42	9.27	.0000
Goals & comm (Scale B)	.27	5.95	.0000
Intention (IIS 36)	.19	4.20	.0000
Age	.12	2.87	.0043
U of M GPA	.10	2.39	.0174

according to Fox (1986), have explained 28.2 to 30.5 percent of the variance in persistence when all of the variables including academic and social integration (but not including career decision-making self-efficacy) have been entered into the regression equation.

CONCLUSIONS AND RECOMMENDATIONS

There is evidence sufficient to warrant inclusion of the variable, career decision-making self-efficacy, as an individual characteristic in further studies of integration. This evidence is supported by data that show a relationship for underprepared college students between perceived career decision-making self-efficacy and integration (overall, social, and academic) and between perceived career decision-making self-efficacy and initial goals and commitments. This conclusion is supported further by data from the regression analyses, which show that perceived career decision-making self-efficacy and initial goals and commitments significantly contribute to the explanation of the variance in overall, social, and academic integration, whereas other background characteristics make a negligible contribution.

Regardless of the fact that perceived career decision-making self-efficacy surpassed all other variables, including initial goals and commitments, in explaining 30 percent of the variance in both overall and academic integration, the explanation is modest. However, the likelihood of a significant relationship between career planning and decision making—specifically, career decision-making self-efficacy—and persistence is enhanced by these findings. A longitudinal follow-up study with the same subjects is called for to determine whether or not the same students, for whom career decision-making self-efficacy and integration was high, persisted in or returned to the institution, and whether or not the same students, for whom integration and career decision-making self-efficacy was low, departed and have not yet returned to the institution. In addition, the nature of the relationship needs to be tested with other populations (not only underprepared students) within the same university, across other types of universities (public and private), and with other types of postsecondary institutions (technical colleges and community colleges).

Based on the fact that initial goals and commitments (Scale B) explains the variance in social integration more than it explains the variance in academic integration, these scales need to be investigated further. Considering that the items that operationalize initial goals and commitments have more of an academic than a social implication (e.g., certainty of choice of major, career plans, and college; importance placed on graduating and success in the chosen field; and belief that the education being sought would be relevant to future employment), the reverse might have been expected. Thus, the relationship between perceived career decision-making self-efficacy and the components of

social and academic integration needs to be further explored. It needs to be determined which of the 10 items that operationalize social integration and which of the 14 items that operationalize academic integration are most related to career decision-making self-efficacy. Similarly, the relationship between perceived career decision-making self-efficacy and the 10 items that operationalize initial goals and commitments needs to be further explored.

Because perceived career decision-making self-efficacy also contributes to the explanation of the variance in social integration, it appears that career planning and decision making are relevant to students' perception not only of their academic integration but of their social integration as well. This conclusion is supported by previous research findings that among the social integration variables, second in importance to program completion was greater satisfaction with the extent of students' career development (Schwartz, 1990a), and with Tinto's (1987) position regarding the mutual interdependence of social and academic integration. Thus, the construct, perceived career decision-making self-efficacy, within the context of the Tinto (1975, 1987) model needs to be further explored. Factor analysis is needed to identify which items that operationalize career decision-making self-efficacy are most salient to integration (social and academic). This recommendation is consistent with that of Betz and Hackett (1986), who identified the need for testing career decision-making self-efficacy within the context of theoretical models and research on the effectiveness of theory-based interventions on career decision-making self-efficacy.

There is evidence sufficient to warrant inclusion of consistent and consecutive registrants, as well as first-quarter students, in studies of integration and persistence. The longer students persist, based on their pattern of registration in the institution, and including those who have left and returned, the stronger the intercorrelation between their perceived career decision-making self-efficacy and integration. The pattern of registration was not significantly correlated with high integration scores alone—nor, when students were grouped on the basis of their registration pattern, were there any significant group differences in their integration scores—but when the variable, perceived career decision-making self-efficacy, was entered into the analysis, the intercorrelation was significant and moderate to strong. Thus, in future studies, research subjects should include students of varying persistence patterns—not just incoming students.

Based on the strong intercorrelations between perceived career decision-making self-efficacy and academic integration for students who did not know their degree aspirations, there is evidence to suggest that these students may benefit most from institutional assistance in career planning and decision making. Thus, incorporating career planning and decision making into college programs—particularly for students who do not know their degree aspirations—is necessary and consistent with recommendations that colleges shift their attention away from prediction and toward the prevention of attrition (Pantages and

Creedon, 1978). In addition, it is appropriate for teaching faculty to incorporate information about career planning and decision making into their classes. Since faculty play a major role in students' academic integration and because career decision-making self-efficacy is a major component of academic integration, if faculty support career planning in the classroom, then students' perceptions of the importance of career planning would be reinforced and their integration into institutions of higher learning potentially could be enhanced.

Since perceived career decision-making self-efficacy is the only background characteristic to emerge as significantly contributing to the explanation of the variance in integration (overall, social, and academic), then other measures of career planning and decision making might also be relevant, and need to be explored within the context of the Tinto (1975, 1987) model.

Finally, if career decision-making self-efficacy is found to be an important variable in explaining the variance in persistence, then experimental research that tests interventions designed to increase career decision-making self-efficacy is appropriate. These interventions would reflect a practical application based on the results of this research.

NOTES

1. The 11 items comprising Initial Goals and Commitments are available from the author.
2. The 24 items comprising Integration are available from the author.
3. Using the SPSS statistical program for stepwise regression, the *enter* command signifies forced entry of all the variables so that the variables are entered one at a time in order of decreasing tolerance. Tolerance is the proportion of a variable's variance not accounted for by the other independent variables in the equation. To identify the predictor variable that contributes the greatest explanation of the variance, the *forward* command is used, which signifies forward entry, meaning that the variables with the smallest probability-of-*F*-value (least likely to be due to chance) are entered if the value is smaller than the entry criterion ($p \leq .05$) and if the variable passes the tolerance test. Only the significant variables are entered automatically in order of their multiple correlation coefficient (*R*).

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