

A PSYCHOLOGICAL MODEL OF STUDENT PERSISTENCE

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The present study examines the validity of the Eccles model of achievement behaviors (model of academic choice) for its predictive validity when the outcome (behavior) is student persistence in the postsecondary educational system to completion of at least the baccalaureate degree. Patterns of effects hypothesized by the theoretical model were only partially supported by the results forthcoming from the estimation of the model. Of the two constructs hypothesized to directly influence persistence—the value placed on college attendance and expectations for success in college—only value had significant influence. Two measures of goal orientations—business/financial and humanitarian/social—exerted indirect influence as hypothesized, but level of degree aspirations had as strong a direct influence on persistence as did value. Prior achievement had the strongest total effects of any of the variables in the model.

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In the recent large body of literature related to student attrition, the dominant perspective underlying the research has been the theoretical, explanatory model of the student persistence/withdrawal process developed by Tinto (1975). Building on the earlier work of Spady (1970, 1971), this model is an outgrowth of Durkheim's (1961) theory of suicide and assumes that persistence/withdrawal behavior is largely a function of the students' commitment to the institution and to their educational goals and the students' integration in the social and academic systems of the academic institution (person-environment fit). Studies examining the student persistence/withdrawal phenomenon within the Tinto framework reflect what Tinto (1986) refers to as an interactional theory of student departure in which both individual and organizational attributes are reflected. It takes the view that student departure reflects "individuals' experience in the total culture of the institution as manifested in both the formal and the informal organization of the institution" (Tinto, 1986, p. 365) and "the

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interpretation and meaning that individuals attach to their experiences within the institution" (Tinto, 1986, p. 366).

The Tinto explanatory model of student persistence/withdrawal behavior gave new theoretical direction to attrition research. Strong support for this theoretical model has been shown in a substantial body of literature. The model has been tested using a variety of institutional settings and samples of students and with the constructs of the model operationalized in numerous ways (see Tinto, 1987 and Pascarella and Terenzini, *in press*, for a review of this literature). The general model has also been adapted to include institutional characteristics and has been applied in studies examining college effects on other outcomes such as occupation and income (see Pascarella and Terenzini, *in press*). The use of this model has been an important vehicle for understanding the importance of students' social and academic involvement within the institution and how these interact in affecting students' subsequent decisions following college matriculation.

An alternative approach to the study of student persistence is offered in the psychological literature. Indeed, it was psychological models of student attrition that dominated the literature for some time (see Tinto, 1986). There has recently appeared in the literature a general model of achievement behaviors (also referred to as a model of academic choice) that while not specifically developed for the study of student attrition from postsecondary institutions offers promise for application in this area. This model specifically elaborates causal relationships that suggest the utility of path analytic methods for model testing as did the Tinto model.

Drawing on the theoretical and empirical work of decision-making, achievement, and attribution theorists (e.g., Atkinson, 1958, 1964; Crandall, 1969; Weiner, 1972, 1974), Eccles (Parsons) and her colleagues (1983) have proposed an integrative theoretical model of achievement behaviors with behaviors defined to be persistence, choice, and performance (see Fig. 1). This model provides a framework that specifies causal relationships among aptitude, socialization, attitudinal factors, and affective factors. Furthermore, "the model assumes that the effects of past achievement and socialization experiences are mediated by one's interpretations of those events in light of cultural influences and a fairly stable perception of oneself" (Meece, Parsons, Kaczala, Goff, and Futterman, 1982, p. 334). A thorough review of the literature from which the model is derived can be found in Eccles et al. (1983) and Meece et al. (1982).

There are two components to the general model: a psychological component in which causal relationships are specified between various student cognitive factors, and a socialization component including factors associated with the beliefs and attitudes of students' parents and teachers. The central constructs within the psychological component—expectations for success and the subjective value of the outcome—are an outgrowth of expectancy-value models (e.g., Atkinson, 1964; Crandall, 1969; Weiner, 1972, 1974). These constructs

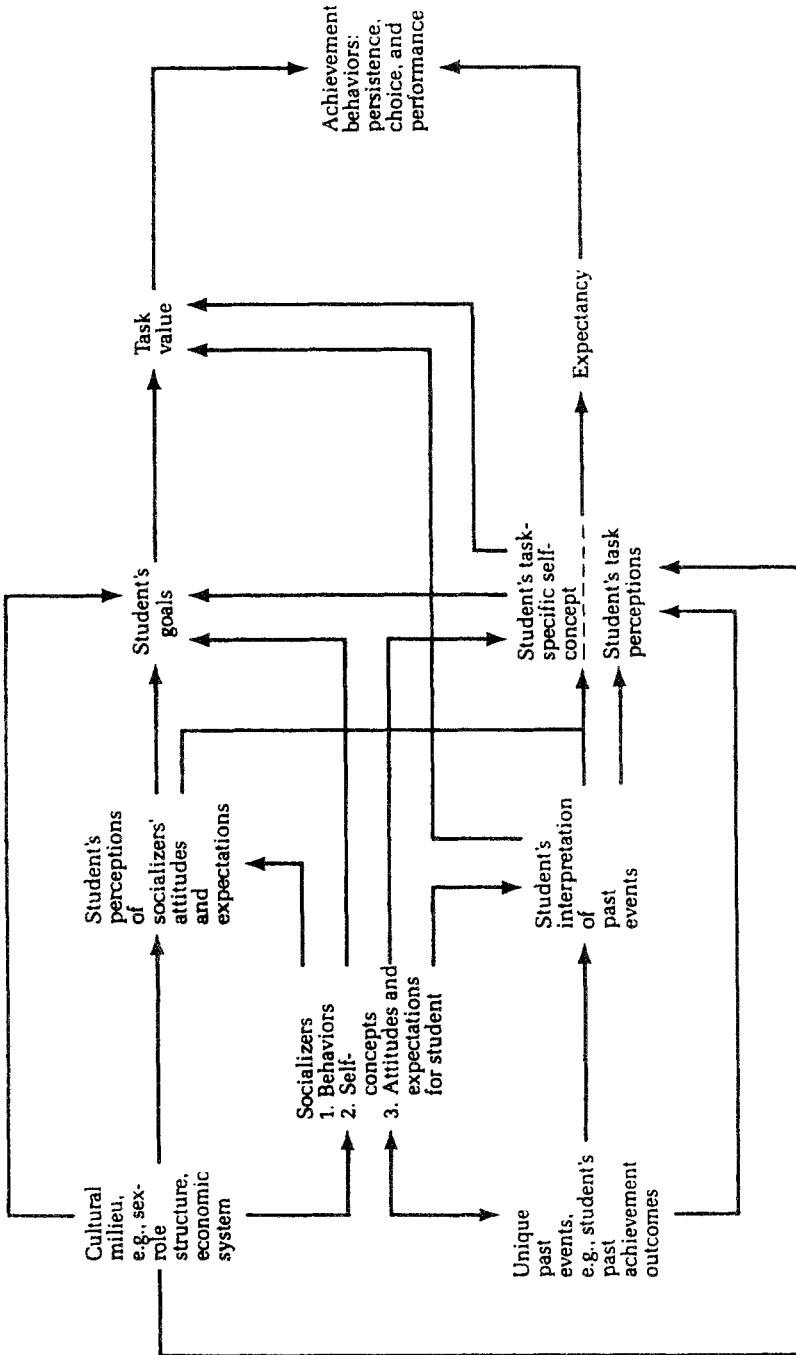


FIG. 1. General model of achievement behaviors (From CHAPTER 2 FROM ACHIEVEMENT AND ACHIEVEMENT MOTIVES. Edited by Janet T. Spence, author; Jacquelynne Eccles et al. Copyright © 1983 by W. H. Freeman and Company. Reprinted with permission).

are central because they are hypothesized to most directly influence outcomes and to serve as mediators of the influence of other constructs within the model. In particular, expectancies and values are posited to be influenced directly by the individual's goals, perceptions of his or her abilities, and perceptions of task demands. These constructs are in turn influenced by the individual's perceptions of socializers' beliefs and behaviors. Each of these constructs is believed to mediate the influences on achievement outcomes that emanate from prior achievement and the cultural environment.

The present study utilizes this theoretical framework to study college students' persistence/withdrawal behavior. In particular, the psychological component of the Eccles (Parsons) model is tested for its predictive validity when the outcome is student persistence in the postsecondary educational system to completion of at least the baccalaureate degree. By applying this perspective the focus is on student motivational and attitudinal beliefs that are hypothesized to influence persistence.

Causal Model

A path analytic model was proposed for the present study operationalizing the constructs contained in the theoretical model shown in Figure 1. The model estimated is shown in Figure 2. The arrows indicate the paths of influence hypothesized by the theoretical model. Where no path is drawn, the effect is hypothesized to be zero. (It should be noted that in the actual estimation of this model, all effects were estimated in order to determine if those paths hypothesized to be zero were in fact nonsignificant.) The first block of variables (prior achievement and family socioeconomic status) are considered exogenous variables and are correlated for reasons unanalyzed in this model. Family socioeconomic status is used as a proxy for the sociocultural influences on the individual. In accordance with the theoretical model, no direct influence of these variables on persistence is expected; that is, their influence is expected to be only indirect by influencing intervening variables.

Subsequent variables in the model are endogenous variables, that is, dependent on prior variables. In accordance with Eccles' theoretical model, no causal relationships are specified between variables within the same block. Their residuals are allowed to be correlated representing the extent to which their correlation is unexplained by the preceding variables. Each of the exogenous variables is seen to influence the first endogenous variable: family encouragement to attend college. The next block of endogenous variables—anticipated difficulty with college coursework and academic self-concept—are posited to be directly influenced by each of the prior variables. These two variables are hypothesized to serve as the predominant mediators of the influence of prior achievement on subsequent variables.

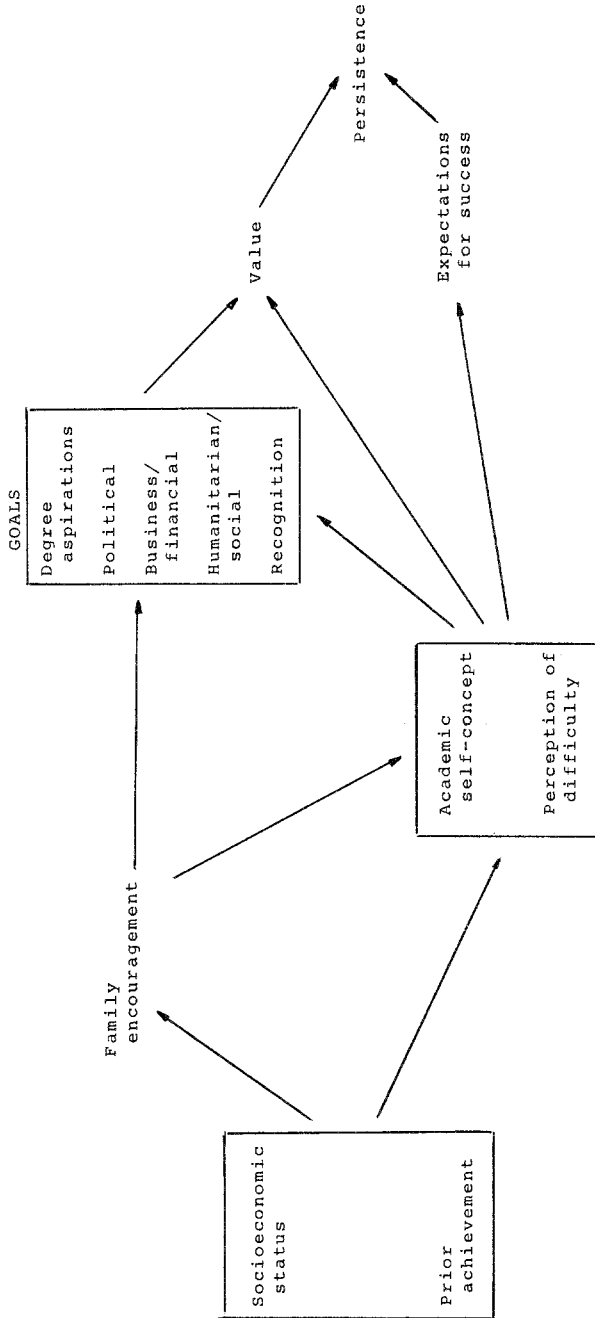


FIG. 2 Estimated model of student persistence.

The next block of variables represent various goals students may set for themselves that would be enhanced by postsecondary education. These goals reflect orientations toward desire for recognition, involvement in humanitarian/social work, business/finance, political involvement, and level of degree aspiration. Goal orientations are expected to be directly influenced only be self-concept, anticipation of difficulty with college coursework, and family encouragement.

The central constructs of the Eccles model—expectation for success in college and the perceived value of college—are contained in the final block of variables. Self-concept and anticipation of difficulty are hypothesized to directly influence each of these measures. An additional direct effect on values is expected from goals. The final variable in the model is persistence to degree completion. As posited by the Eccles model, only expectation for success and value are expected to directly influence persistence, but indirect influence is hypothesized from preceding variables in the model with value and expectations being the predominant mediators.

METHOD

The Data

Data for this study were drawn from the Cooperative Institutional Research Project (CIRP) sponsored by the American Council on Education and the University of California, Los Angeles (see Astin, 1982). This longitudinal study was designed to produce data on a wide range of cognitive and affective characteristics of college students. The respondents were surveyed initially as entering freshmen in the fall of 1971 and again in a follow-up survey during the winter of 1980.

The variables described above that operationalize the constructs of the theoretical model were constructed predominantly from items included in the base-year questionnaire. The exception was the variable measuring persistence that was constructed from items in the follow-up survey. The construction of these variables is described in Table 1. There were 8,790 respondents to the CIRP surveys who had complete data for the variables described in Table 1. Because such a large sample would produce statistically significant results for even the smallest effect, a random sample of 500 of those students was selected for the model estimation.

Analysis

Analyzing the means, standard deviations, and correlations given in Table 2, the causal effects implied by the model were estimated with ordinary least squares procedures using GEMINI (Wofle and Ethington, 1985), a FORTRAN

TABLE 1. Variable Definitions

Socioeconomic status	Combined parental income (twelve categories from "less than \$4,000" to "\$40,000 or more") and mother's and father's education (six levels each from "grammar school or less" to "postgraduate degree") were summed after standardizing ($\alpha = .765$).
Prior achievement	High school grades (1 = "D" to 8 = "A or A+" and high school rank (1 = "4th quarter" to 4 = "top quarter") were summed after standardizing ($\alpha = .808$).
Family encouragement	Student's rating of the importance of "my parents wanted me to go" as being a reason for attending college. Levels ranged from 1 = "not important" to 3 = "very important."
Academic self-concept	Sum of student's self-rating of academic ability and intellectual self-confidence. Each was coded 1 = "lowest 10%," 2 = "below average," 3 = "average," 4 = "above average," and 5 = "highest 10%" ($\alpha = .654$).
Perception of difficulty	Response to "the likelihood of failing one or more courses" with values ranging from 1 = "no chance" to 4 = "very good chance."
Degree aspirations	Recoded such that 1 = "none," 2 = "associate," 3 = "bachelor's," 4 = "master's," and 5 = "doctorate, medical, law, or divinity."
Political goals	Factorially derived scale computed by summing across student's ratings of the importance of "influencing the political structure," "influencing social values," "becoming a community leader," and "keeping up with political affairs." Each item was rated from 1 = "not important" to 4 = "essential" ($\alpha = .737$).
Business/financial goals	Factorially derived scale computed by summing across student's ratings of the importance of "becoming an expert in finance and commerce," "having administrative responsibility," "being very well off financially," and "being successful in own business." Each item was coded as above ($\alpha = .699$).
Humanitarian/social goals	Factorially derived scale computed by summing across student's ratings of the importance of "having friends with different backgrounds and interests from mine," "helping others in difficulty," "participating in an organization like the Peace Corps or VISTA," and "becoming involved in programs to clean up the environment." Each item was coded as above ($\alpha = .620$).

(Continued)

TABLE 1. (Continued)

Desire for recognition	Factorially derived scale computed by summing across student's ratings of the importance of "becoming an authority in my field" and "obtaining recognition from my colleagues for contributions in my special field." Each item was coded as above ($\alpha = .657$).
Expectations for success	Sum of student's ratings of the likelihood of "making at least a B average" and "graduating with honors." Each was coded from 1 = "no chance" to 4 = "very good chance" ($\alpha = .656$).
Value	Sum of student's ratings of the importance of the following as outcomes of college attendance: being able to contribute more to the community, being able to get a better job, gaining a general education and appreciation of ideas, improving reading and study skills, becoming a more cultured person, ability to make more money, learning more about things of personal interest, and preparation for graduate or professional school. Each item was coded 1 = "not important," 2 = "somewhat important," and 3 = "very important" ($\alpha = .636$).
Persistence	Computed variable representing degree status coded 1 = "less than bachelor's degree," 2 = "currently hold or working on bachelor's degree," 3 = "currently hold or working on master's degree," and 4 = "currently hold or working on doctoral/advanced professional degree."

program based on the work of Sobel (1982) that computes indirect effects and their standard errors in addition to the usual regression results. Three types of effects were forthcoming—direct, indirect, and total. The direct causal effects are represented by regression coefficients, either standardized (beta weights) or unstandardized (b weights), and are interpreted in the usual manner. The indirect causal effects are estimated by the sums of the products of direct effects through intervening variables in the model. These effects represent influences on the dependent variable that result from directly influencing prior causal variables in the model. The total causal effects are simply the sum of the direct and indirect effects. The relative influence of variables within an equation is determined by comparing the standardized coefficients.

RESULTS

The parameter estimates for the eleven equations defining the model are given in Table 3. Inspection of equation 13 indicates that the variables in the model explain about 14% of the variance in persistence. In accordance with the

TABLE 2. Correlations, Means, and Standard Deviations (N = 500)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SES	1.000												
2. Prior Achievement	.179	1.000											
3. Family Encouragement	.056	-.042	1.000										
4. Academic Self-Concept	.222	.504	.006	1.000									
5. Perception of Difficulty	-.003	-.200	.059	-.249	1.000								
6. Degree Aspirations	.207	.174	-.038	.285	-.085	1.000							
7. Political Goals	.001	-.043	.158	.144	-.030	.125	1.000						
8. Business Goals	-.100	-.217	.184	-.046	.002	.098	.359	1.000					
9. Humanitarian Goals	.007	.016	.094	-.023	.026	-.021	.427	.133	1.000				
10. Desire for Recognition	-.014	.060	.117	.135	-.109	.193	.312	.395	.116	1.000			
11. Expectations for Success	.036	.398	-.027	.486	-.411	.311	.126	-.004	.021	.191	1.000		
12. Value	-.129	-.015	.180	.016	-.044	.150	.265	.336	.199	.278	.154	1.000	
13. Persistence	.152	.228	.047	.232	-.053	.257	.072	.026	-.003	.109	.171	.168	1.000
Means	.070	.097	2.030	7.296	2.132	4.034	8.430	7.586	9.922	5.030	5.894	20.788	2.444
St. Devs.	2.620	1.891	.703	1.263	.678	1.298	2.303	2.408	2.097	1.432	1.101	3.056	.803

TABLE 3. Direct Effects in Psychological Model of Student Persistence^a

	Dependent Variables											
	3	4	5	6	7	8	9	10	11	12	13	
1. SES	.066 (.018)	.135* (.065)	.030 (.008)	.153* (.076)	-.030 (-.026)	-.085 (-.079)	.003 (.003)	-.048 (-.026)	-.098* (-.041)	-.143* (-.167)	.091** (.028)	
2. Prior Achievement	-.054 (-.020)	.480* (.321)	-.203* (-.073)	.023 (.016)	-.144* (-.175)	-.245* (-.312)	.045 (.050)	-.007 (-.006)	.179* (.105)	.042 (.068)	.145* (.061)	
3. Family Encouragement	.019 (.033)	.049 (.047)	-.046 (-.086)	.153* (.180)	-.180* (.501)	.180* (.616)	.095 (.283)	.123* (.251)	-.004 (-.006)	.123* (.535)	.026 (.029)	
4. Academic Self-Concept			.235* (.241)	.219* (.398)	.086 (.164)	-.042 (-.070)	.127** (.144)	-.034 (-.082)	.280* (.244)	-.034 (-.082)	.091 (.058)	
5. Perception of Difficulty			-.018 (-.035)	-.013 (-.046)	-.037 (-.131)	.018 (.057)	-.087 (-.183)	-.281* (-.457)	-.028 (-.127)	-.028 (.135*)	.020 (.024)	
6. Degree Aspirations								.180* (.152)	.180* (.319)	.162* (.100)		
7. Political Goals								.045 (.022)	.074 (.098)	.017 (.006)		
8. Business Goals								-.025 (-.011)	.205* (.260)	-.010 (-.003)		
9. Humanitarian Goals								.012 (.006)	.118* (.173)	-.042 (-.016)		
10. Desire for Recognition								.071 (.055)	.117** (.249)	.018 (.010)		
11. Expectations for Success										-.004 (-.003)		
12. Value										.155* (.041)		
13. Persistence R ²	.006	.272	.043	.106	.062	.091	.011	.041	.395	.205	.138	

^a Metric coefficients are given in parentheses.* $p < .01$; ** $p < .05$.

theoretical model, only value and expectations for success were expected to directly influence persistence with the influence of other variables expected to be only indirect. As can be seen, however, the influence of expectations for success is not significant, and four variables have significant direct effects (socioeconomic status, prior achievement, degree aspirations, and value). The later three variables have approximately the same influence on persistence (betas = .145, .162, and .155, respectively) and the influence of socioeconomic status is slightly less (beta = .091). The positive effects seen from these measures indicate that having higher status backgrounds, higher levels of prior achievement, higher degree aspirations, and higher values relative to college attendance directly enhances the likelihood of persistence in postsecondary educational systems to degree completion.

Examining the equations for the central constructs of the theoretical model—value and expectations for success—there are again differences between the hypothesized influences suggested by the theoretical model and the significant direct effects forthcoming. It was hypothesized that only academic self-concept, perception of difficulty, and goals would directly influence a student's value of college attendance. Self-concept and perception of difficulty do not have significant direct influence on value, but four of the five goal orientations do exert significant effects (degree aspirations, beta = .135; business goals, beta = .205; humanitarian/social goals, beta = .118; and desire for recognition, beta = .117). Two additional influences are seen from family encouragement (beta = .123) and family socioeconomic status (beta = -.143). The dominant direct effects on expectations for success come from academic self-concept (beta = .280) and perception of difficulty (beta = -.281) as hypothesized. Other significant direct effects are seen from degree aspirations (beta = .180), prior achievement (beta = .179), and socioeconomic status (beta = -.098). The negative effects of socioeconomic status on value and expectations for success indicate that net of the influence of other variables, students from families with lower socioeconomic status are more likely to perceive themselves as doing well in college and place a greater value on college attendance.

The indirect and total effects on persistence from the variables in the model are given in Table 4. As can be seen, all of the indirect effects are of nominal magnitude and only four are statistically significant at the .05 level. Two of the measures of goal orientations—business/financial and humanitarian/social—have significant positive indirect influence (.032 and .018, respectively) with that influence mediated through value. Thus, while these measures do not directly influence persistence, having higher orientations toward business/financial or humanitarian/social goals does increase the likelihood of persistence because the value placed on college attendance is likely to be higher. Self-concept serves a dual role with respect to the indirect influences seen in the

TABLE 4. Indirect and Total Effects of Variables on Persistence^a

	Direct	Indirect	Total
SES	.091** (.028)	.024 (.007)	.115* (.035)
Prior Achievement	.145* (.061)	.062** (.027)	.207* (.088)
Family Encouragement	.026 (.029)	.024 (.028)	.050 (.057)
Academic Self-Concept	.091 (.058)	.050** (.032)	.141* (.090)
Perception of Difficulty	.020 (.024)	-.011 (-.014)	.009 (.010)
Degree Aspirations	.162* (.100)	.020 (.012)	.182* (.112)
Political Goals	.017 (.006)	.011 (.004)	.028 (.010)
Business Goals	-.010 (-.003)	.032** (.011)	.022 (.008)
Humanitarian Goals	-.042 (-.016)	.018** (.007)	-.024 (-.009)
Desire for Recognition	.018 (.010)	.018 (.010)	.036 (.020)
Expectations for Success	-.004 (-.003)		-.004 (-.003)
Value	.155* (.041)		.155* (.041)

^a Metric coefficients are given in parentheses.

* $p < .01$; ** $p < .05$.

model. In addition to indirectly influencing persistence by enhancing degree aspirations, it serves as the dominant mediator for the indirect influence of prior achievement.

The total effects represent the combined direct and indirect influences of the variables in the model. Prior achievement has the greatest total influence of any variable, which is the result of having significant direct and indirect effects on persistence. The significant total effects of socioeconomic status, degree aspirations, and value are the result of only direct influence. In contrast, self-concept had only indirect influence in the model, but that influence was strong enough to result in a significant total effect.

CONCLUSIONS

The purpose of this study was to examine the validity of the psychological

component of the Eccles (Parsons) model of achievement behaviors for its application in the study of college students' persistence to degree completion. The results reported above then lend only slight support for the validity of the Eccles model within this context. The lack of support, however, is not with respect to the constructs of the model but rather with the hypothesized patterns of effects. The theoretical model posits that only the value placed on college attendance and the expectations for success in college would directly influence persistence and that influences of other constructs would be only indirect, mediated through value and expectations. In the estimation of the model, value does exert positive influence and serves as mediator for some of the indirect influences, but expectations has no influence at all.

Students' goal orientations were hypothesized to influence persistence only indirectly by enhancing the value placed on college attendance. Two of the five goal orientations—business/financial and humanitarian/social—did exert influence in this way. However, level of degree aspirations had as strong a direct influence on persistence as did value and served as the dominant mediator of the indirect influence of self-concept.

One of the major premises of the theoretical model is that prior achievement does not influence achievement behaviors directly but only indirectly by exerting influence on family encouragement, self-concept, and perception of difficulty. These results found prior achievement to have the strongest total effects of any of the variables in the model. Not only does it have approximately the same direct influence on persistence as value but it exerts one of the strongest indirect influences as well.

The effects seen from family socioeconomic status are also not as anticipated. This variable serves as a proxy measure of the sociocultural influences on the student and was expected to exert only indirect influence on achievement behavior outcomes. With the outcome defined as persistence, family socioeconomic status had a direct positive influence as strong as that of value. However, the conflicting negative effects of family socioeconomic status on value and expectations for success do not translate into significant indirect influence on persistence. These latter influences raise questions that are not answered in this study. Apparently students whose parents have higher levels of socioeconomic status attend college for different reasons than those from lower status backgrounds. Students from lower status backgrounds tend to place greater value on college attendance and tend to have higher expectations for success there than do students from higher status backgrounds, all other things being equal.

The pattern of strong direct effects on persistence from student background measures (prior achievement and socioeconomic status) reported here differ not only from the hypothesized pattern of effects within the theoretical model but also from the general pattern seen in other persistence studies. Studies that have

employed the Tinto model or some variation thereof have generally found the influence of background to be predominantly indirect, influencing the type of institution attended and social and academic behaviors within the institution. Thus, the strong direct influences seen in this model may be the result of lack of control for institutional characteristics and social and academic integration.

While several hypothesized patterns of effects were not forthcoming, the importance of the value placed on college attendance and goal orientations were reinforced. One of the measures of student goal orientations found to have influence on persistence in this study—level of degree aspiration—has as its counterpart a construct in the Tinto model of student persistence/withdrawal behavior. The Tinto model incorporates a construct reflecting commitment to the goal of college completion. Studies examining the validity of the Tinto model have similarly shown goal orientations to an important consideration in students' persistence in college (e.g., Pascarella and Chapman, 1983; Pascarella and Terenzini, 1980). Thus, it is suggested that in order to enhance the likelihood of students persisting in college, early interventions should be directed at helping students formulate and articulate their goals, be they academic (degree aspirations) or otherwise (e.g., business/financial and humanitarian/social). In the latter case, it would be expedient to help students understand the value of a college education in attaining those goals.

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