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ABSTRACT

This study investigates the relationships among community college student characteristics, student enrollment and registration behaviors, and academic outcomes. The report examines whether there are interrelationships among the enrollment and registration behaviors studied and interrelationships among the academic outcomes studied. Also it investigates if enrollment and registration behaviors can predict student academic outcomes. The report investigates five student characteristic variables: age, gender, ethnicity, academic intent, and financial aid eligibility. Five enrollment and registration (predictor) variables were also studied: when students enrolled, number of changes made to their course schedule, how many schedule changes were drops and how many were adds, and when changes were made. It explores three outcomes: fall semester grade point average, fall semester course completion, and attrition (whether the students enrolled for the spring semester). Significant relationships were found between several student characteristics and enrollment and registration behaviors. Significant interrelationships among the enrollment and registration behaviors and academic outcomes were found. A combination of four enrollment and registration behaviors could predict 37.6% of the variation in fall semester GPA and 48.6% of the variation in course completion. A combination of three enrollment and registration behaviors was included in a model that could best predict the odds of attrition. A combination of three enrollment and registration behaviors could predict 13.7% of the variation in GPA beyond the 10.3% predicted by student characteristics. A combination of four enrollment and registration behaviors could predict 43.9% of the variation in course completion beyond the 10.3% predicted by student characteristics. (VWC)

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Enrollment and Registration Behaviors as Predictors of Academic Outcomes for Full-Time Students in a Rural Community College

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The purpose of this study was to investigate the relationships between community college student characteristics, student enrollment and registration behaviors, and academic outcomes. The research included the examination of whether there were interrelationships among the enrollment and registration behaviors studied and interrelationships among the academic outcomes studied. Finally, the study also investigated if enrollment and registration behaviors could predict student academic outcomes.

This study was based on an ex post facto research design that involved the investigation of a sample of students during one period of their enrollment at a small rural community college. The sample (n = 1,365) for this study was comprised of 473 students who first enrolled in the fall semester of 1994, 461 students who first enrolled in the fall semester of 1995, and 431 students who first enrolled in the fall semester of 1996.

The five student characteristic variables investigated in this study were student age, gender, ethnicity, academic intent, and financial aid eligibility. The enrollment and registration (predictor) variables examined in this study were: (a) when students initially enrolled for the fall academic semester, (b) how many changes students made to their course schedule, (c) how many of the course schedule changes were drops, (d) how many of the course schedule changes were adds, (e) how many of the course schedule changes were section changes, and (f) when were changes were made to their course schedule. The three outcomes variables explored in this study were: fall semester grade point average, fall semester course completion, and attrition (whether the student enrolled for the spring semester).

Using a maximum alpha level of .05, the research hypotheses were examined using independent samples t-tests, Spearman rank-order correlation coefficients, multiple linear regression, and logistic regression. For each regression analysis involving the student characteristics as control variables, they were forced into block 1 so that their collective influence could be determined when the predictor variables were entered stepwise into block 2 of the analysis. For the logistic regression analyses involving the student characteristics as control variables, they were included in the regression by utilizing the enter method for block 1; the enrollment and registration behaviors were entered into the analyses utilizing the forward likelihood-ratio (LR) method.

Summary of Findings

Relationships Between Student Characteristics and Enrollment and Registration Behaviors

Research question 1 asked if there was any relationship between student characteristics and enrollment and registration behaviors. In this study, student age, gender, ethnicity, academic intent, and financial aid eligibility were the characteristics investigated. These five student characteristics were examined in relation to six enrollment and registration behaviors.

Hypothesis I and the related sub-hypotheses examined the differences in the number of days in relation to the start of the fall semester that a student initially enrolled as it related to the five pairs of subgroups of students based on their characteristics. This variable was found to have a statistically significant relationship ($p < .005$) with all five student characteristics investigated in this study. Students who were traditional-age (less than 25 years old), on average, initially enrolled for fall semester classes earlier than nontraditional-age students ($M = 96.99$ days compared to $M = 64.27$ days). Female students, on average, initially enrolled for fall semester classes earlier than male students ($M = 96.40$ days compared to $M = 88.27$ days). White students, on average, initially enrolled for fall semester earlier than Black students ($M = 92.30$ days compared to $M = 63.95$ days). Students who were transfer majors, on average, initially enrolled for the fall semester earlier than students who were occupational majors ($M = 97.00$ days compared to $M = 86.17$). Finally, students not eligible for financial aid, on average, initially enrolled for the fall semester earlier than students who were eligible for aid ($M = 101.25$ days compared to $M = 81.48$ days).

Hypothesis II and the related sub-hypotheses examined the number of changes students made to their fall course schedule. This variable was found not to have any statistically significant relationship ($p < .05$) with any of the five student characteristics studied.

Hypothesis III and the related sub-hypotheses investigated the kinds of change students made to their fall course schedule. These changes could be in the form of course drops, course adds, or course section changes. Each of these three kinds of changes was analyzed separately for the five student characteristics studied. Only three statistically significant relationships ($p < .05$) were found: Black students, on average, were found to have a statistically significant greater number of course drops than White students ($M = 2.07$ course drops compared to $M = 1.50$ course drops); students with an occupational major, on average, had a statistically significant greater number of course adds than students with a transfer major ($M = .93$ course adds

compared to M = .78 course adds); and finally, female students, on average, were found to have a statistically significant greater number of course section changes than male students (M = .36 course section changes as compared to M = .26 course section changes). The other 12 relationships investigated between the kinds of courses schedule changes and student characteristics were found not to be statistically significant.

Hypothesis IV and related sub-hypotheses investigated the proportion of course changes made in the early add-drop period. Female students, on average, were found to make a statistically significant larger proportion of their course schedule changes in the early add-drop period than male students (M = .532 compared to M = .435). White students, on average, were found to make a statistically significant larger proportion of their course schedule changes in the early add-drop period than Black students (M = .506 compared to M = .362). Finally, students who were not eligible for financial aid, on average, were found to make a statistically significant larger proportion of their course schedule changes in the early add-drop period than students who were eligible for financial aid (M = .539 compared to M = .426).

Interrelationships Between Enrollment and Registration Behaviors

Research question 2 asked if there were any interrelationships between the enrollment and registration behaviors. Hypothesis V investigated the relationships between the six enrollment and registration behaviors using correlation coefficients that accounted for unequal variances. Acknowledging a non-normal distribution of the data, a total of 15 Spearman rank-order correlation coefficients were examined to determine the relationships between the enrollment and registration behaviors investigated in this study. Twelve of these coefficients resulted in a statistically significant correlation. These coefficents, for the purposes of explanation, were categorized into three areas: strong correlation ($r_s > .699$), moderate correlation ($.300 <= r_s < .700$), and weak correlation ($r_s < .3$).

Interrelationships Between Student Academic Outcomes

Research question 3 asked if there were any interrelationships between the student academic outcomes investigated in the study. Hypothesis VI and related sub-hypotheses investigated the relationships between fall semester grade point average, fall semester course completion, and attrition (as measured by enrollment in the spring semester). A Spearman rank-

order correlation coefficient was utilized to investigate the relationship between fall semester GPA and fall semester course completion and results indicated a strong correlation (r_s = .544, p = .000). This finding suggests that higher student fall semester GPAs are related to higher proportions of courses completed for the semester; conversely, it also suggests that lower student fall semester GPAs are related to lower proportions of courses completed for the semester.

The relationships between fall semester GPA and attrition and fall semester course completion and attrition were both tested by independent samples t-tests. Fall semester GPA was found to be significantly related to attrition, with students who did not enroll in the spring semester on average earning a GPA of 1.71 as compared to students who did enroll for the spring semester earning a mean GPA of 3.50.

An alternative test was also conducted by removing from the student sample 137 students who earned a 0.00 GPA for the fall semester. This level of GPA indicated that those students had dropped all of their courses prior to the end of the semester. Rationale for this alternative analysis lies in the interpretation of GPA as a measure of academic performance and dropping all courses could be considered as no academic performance at all. Further, since the institution studied had a 5.00 grade point average scale, 1.00 was equated with flunking a class. The independent samples t-test for this alternative analysis still indicated a significant relationship between GPA and attrition with students who did not enroll in the spring semester on average earning a GPA of 2.54 as compared to students who did enroll for the spring semester earning a mean GPA of 3.66.

The relationship between fall semester course completion and attrition was also found to be significant, with students who did not enroll in the spring semester completing an average of only 25.3% of their credit hours enrolled in as compared to students who did enroll for the spring semester completing an average of 70.6% of their credit hours.

These findings allowed the researcher to reject the three sub-hypotheses related to research Hypothesis VI – (a) There is no relationship between fall semester grade point average and fall semester course completion, (b) There is no relationship between fall semester grade point average and attrition, and (c) There is no relationship between fall semester course completion and attrition.

Student Enrollment and Registration Behaviors as a Predictor of Student Academic Outcomes

Research question 4 asked if enrollment and registration behaviors could predict student academic outcomes. Hypothesis VII and the related sub-hypotheses examined whether the enrollment and registration behaviors investigated in this study could predict fall semester GPA, fall semester course completion and attrition. Multiple linear regression analyses were utilized to determine if enrollment and registration behaviors could predict fall semester GPA and fall semester course completion. Logistic regression analysis was utilized to determine if enrollment and registration behaviors could predict the odds related to attrition since it was a dichotomous categorical variable. A statistically significant association was found between enrollment and registration behaviors and all three academic outcomes.

The first multiple regression analysis of enrollment and registration behaviors as predictor variables for fall semester GPA resulted in a model that could explain 37.6% of the variance in fall semester GPA from a combination of four enrollment and registration behaviors ($F = 157.712$; $df = 4, 1048$, $p = .000$). A stepwise regression method was utilized with all the predictor variables entered in block 1. Statistically significant contributions were found with number of course drops, number of course adds, proportion of schedule changes made in the early add-drop period, and when a student initially enrolled included in the regression model. The regression model indicated that for each one-course increase in number of course drops, fall semester GPA would be decreased by .496; for each one-course increase in number of course adds, fall semester GPA would be increased by .382; making all as opposed to none of one's schedule changes in the early add-drop period was related to fall semester GPA being increased by .447; and for each one-day increase in when a student initially enrolled, fall semester GPA would be increased by .003.

The second multiple regression analysis of enrollment and registration behaviors as predictor variables for fall semester course completion resulted in a model that could explain 48.6% of the variance in fall semester course completion from a combination of four enrollment and registration behaviors ($F = 248.066$; $df = 4, 1048$, $p = .000$). A stepwise regression method was utilized with all the predictor variables entered in block 1. Statistically significant contributions were found with proportion of schedule changes made in the early add-drop period, number of course drops, number of course adds, and when a student initially enrolled included in the regression model. The regression model indicated that when all course changes were made in

the early add-drop period, fall semester course completion would be increased by .228; for each one-course increase in number of course drops, fall semester course completion would be decreased by .122; for each one-course increase in number of course adds, fall semester course completion would be increased by .077; and for each one-day increase in when a student initially enrolled, fall semester course completion would be increased by 001.

The logistic regression analysis of enrollment and registration behaviors as predictors of the odds for attrition resulted in a model that could predict the odds with a combination of three variables. This model included the enrollment and registration variables: number of course drops, when a student initially enrolled, and number of course adds. The regression model indicated that for each additional course drop a student made during the fall semester, the odds of enrolling for the spring semester decreased by 50.7%, for each additional course add, the odds of enrolling for the spring semester increased by 60.3%, and for each additional day earlier that a student initially enrolled for the fall semester, the odds of enrolling for the spring semester increased by 1.2%.

Student Enrollment and Registration Behaviors as a Predictor of Student Academic Outcomes While Holding Student Characteristics Constant

Research question 5 asked if, while controlling for student characteristics, enrollment and registration behaviors could predict student academic outcomes. Hypothesis VIII and the related sub-hypotheses examined whether enrollment and registration behaviors investigated in this study could predict fall semester GPA, fall semester course completion and attrition, while holding student characteristics constant. Multiple linear regression analyses were utilized to determine if enrollment and registration behaviors could predict fall semester GPA and fall semester course completion beyond that predicted by student characteristics. Logistic regression analysis was utilized to determine if enrollment and registration behaviors could predict the odds of attrition beyond that predicted by student characteristics since it was a dichotomous categorical variable. A statistically significant association was found between enrollment and registration behaviors and all three academic outcomes beyond what could be accounted for by a combination of student characteristics.

The multiple regression analysis of enrollment and registration behaviors as predictor variables for fall semester GPA, while holding student characteristics constant, resulted in a model that could explain 33.9% of the variance in fall semester GPA beyond the 6.5% explained

by a combination of five student characteristics variables. This regression model indicated that a combination of student characteristics and four enrollment and registration behaviors (F = 69.442; df = 9, 922, p = .000) resulted in a statistically significant regression model. The four enrollment and registration behaviors in this model were (a) number of course drops, (b) number of course adds, (c) proportion of schedule changes made in the early add-drop period, and (d) when a student initially enrolled. For this model, all of the student characteristic variables (control) were forced into block 1 of this regression analysis. The enrollment and registration behaviors (predictors) were entered stepwise in block 2. The regression model indicated that being a traditional-age student was related to a .260 higher fall semester GPA than a nontraditional-age student, being White was related to a .379 higher fall semester GPA than being Black, and being eligible for financial aid was related to a .220 lower fall semester GPA than not being eligible for financial aid. In addition, each one-course increase in DROPS was related to a .478 lower fall semester GPA, each one-course increase in ADDS was related to .366 higher fall semester GPA, making all as opposed to none of one's schedule changes in the early add-drop period was related to .430 higher fall semester GPA, and each one-day increase in when a student initially enrolled was related to .002 higher fall semester GPA.

The multiple regression analysis of enrollment and registration behaviors as predictors for fall semester course completion resulted in a model that could explain 43.9% of the variance in fall semester course completion from a combination of four enrollment and registration behaviors beyond the 8.6% of variation accounted for by a combination of student characteristics. This regression model indicated that a combination of student characteristics and four enrollment and registration behaviors (F = 113.093; df = 9, 922, p = .000) resulted in a statistically significant regression model. The enrollment and registration behaviors included in this model were (a) number of course drops, (b) proportion of schedule changes made in the early add-drop period, (c) number of course adds, and (d) when a student initially enrolled. For this model, all of the student characteristic variables (control) were forced into block 1 of this regression analysis. The enrollment and registration behaviors (predictors) were entered stepwise in block 2. The regression model indicated that being White was related to a .149 higher fall semester course completion than being Black and being eligible for financial aid was related to a .057 higher fall semester course completion than not being eligible for financial aid. In addition, each one-course increase in course drops was related to .120 lower fall semester

course completion, making all as opposed to none of one's schedule changes in the early add-drop period was related to a .223 higher fall semester course completion, each one-course increase in course adds was related to a .074 higher fall semester course completion, and each one-day increase in when a student initially enrolled was related to a .001 higher fall semester course completion.

The logistic regression analysis of enrollment and registration behaviors as predictors of the odds of attrition in combination with student characteristics could best predict the odds of attrition with three of the six enrollment and registration variables. The number of course drops, when a student initially enrolled, and number of course adds in combination could best predict the odds of student attrition. The regression model indicated that for each additional course drop a student made during the fall semester, the odds of enrolling for the spring semester decreased by 50.2%, for each additional day earlier that a student initially enrolled for the fall semester, the odds of enrolling for the spring semester increased by 1.3%, and for each additional course add, the odds of enrolling for the spring semester increased by 52.8%. With the predictor variables in this model, none of the student characteristic variables (control) were statistically significant in the regression model.

Research Questions

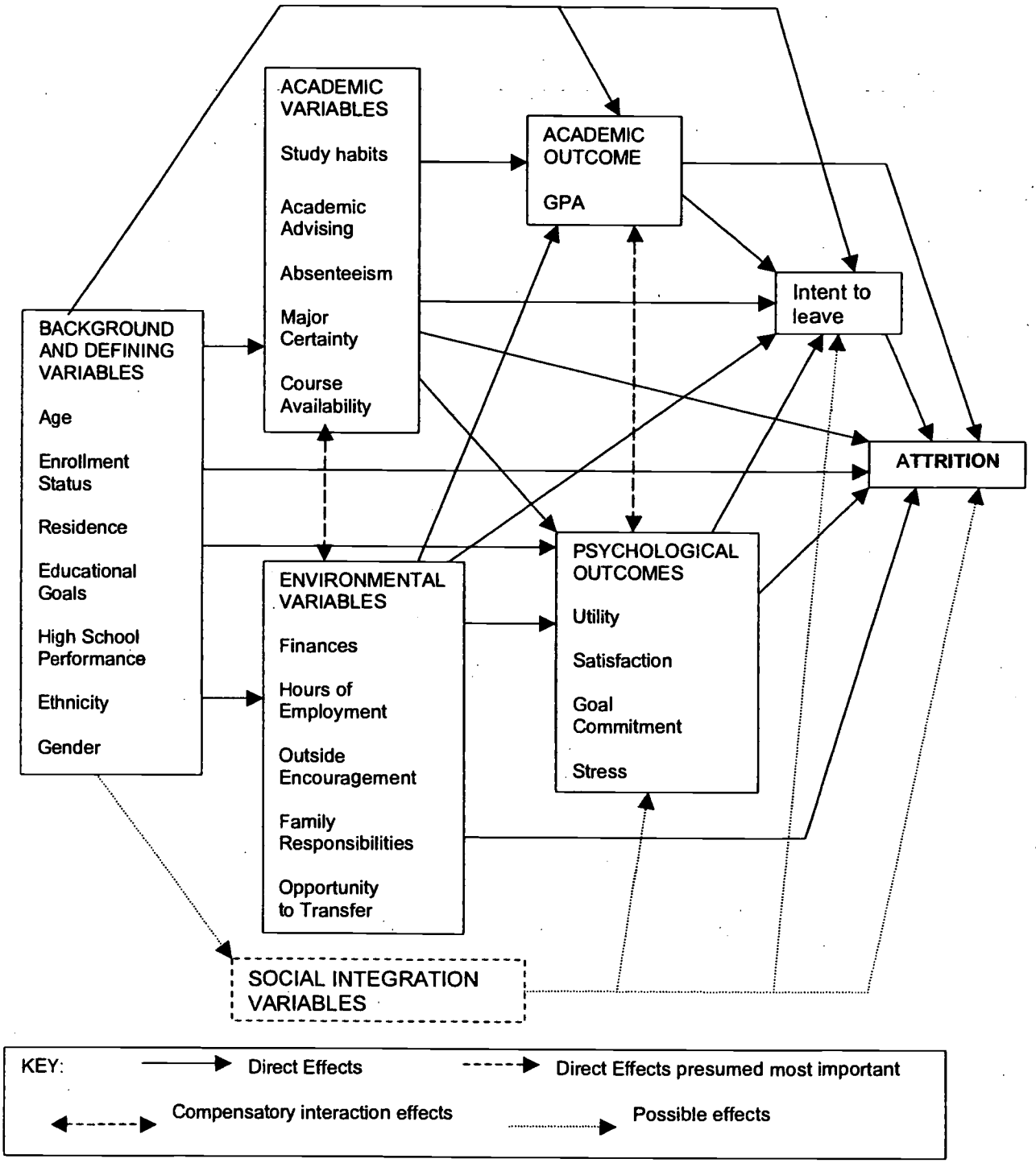
1. What are the relationships between student characteristics and enrollment and registration behaviors?

2. What are the interrelationships among enrollment and registration behaviors?

3. What are the interrelationships among student academic outcomes?

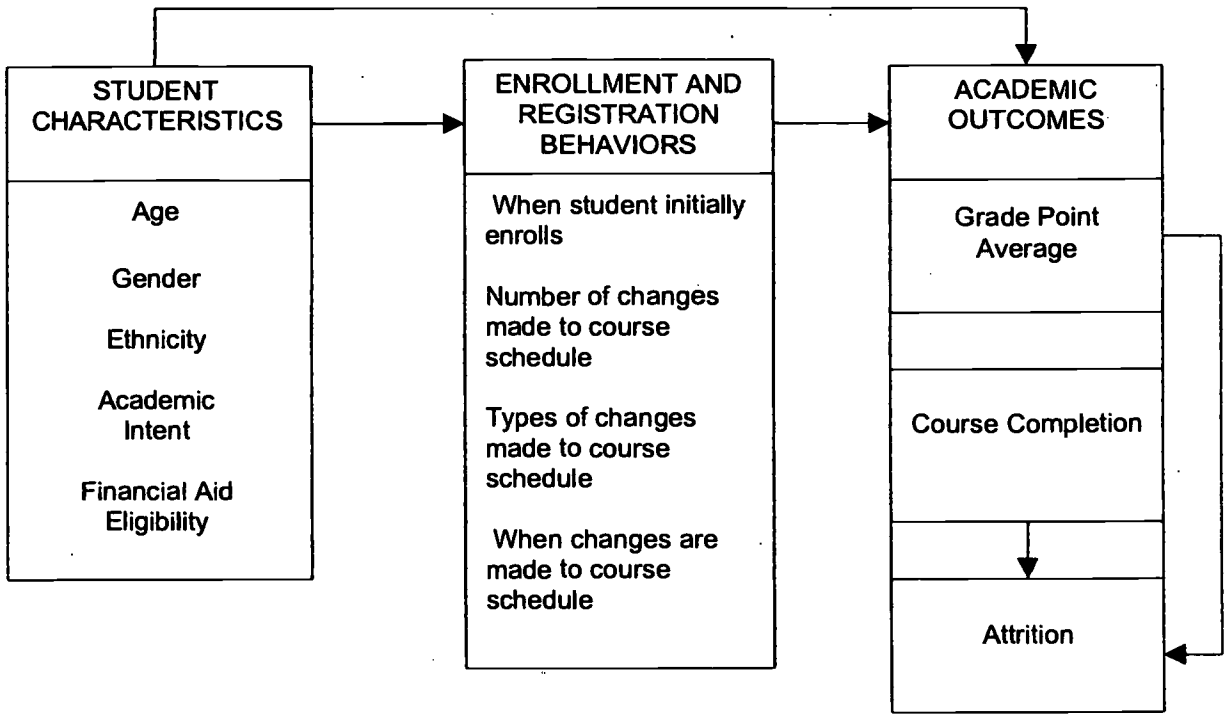
4. Do student enrollment and registration behaviors predict student academic outcomes?

5. Controlling for student characteristics, do enrollment and registration behaviors predict student academic outcomes?



Bean and Metzner model of non-traditional student attrition (1985)

Conceptual Framework for Research on Enrollment and Registration Behaviors as Predictors of Student Academic Outcomes



Student Characteristics Variables	Enrollment and Registration Behavior Variables
Age Traditional Nontraditional Gender Female Male Ethnicity Black White Academic Intent Occupational Transfer Financial Aid Eligibility Not Eligible Eligible	When student initially enrolls for fall semester (# of days in relation to start of semester) How many changes made to course schedule (total #) What types of changes made to the course schedule a. Number of course drops b. Number of course adds c. Number of course section changes When changes are made to the course schedule (proportion in the early add-drop period)

Academic Outcomes Variables

1. **Fall Semester Grade Point Average**
   (5.00 scale)

2. **Fall Semester Course Completion**
   (Proportion of credit hours completed)

3. **Attrition**
   (Whether or not the student enrolled in the following spring semester)

Definitions and Coding of Variables

Variable	Definition and Coding
Age	25 years and older, nontraditional-age = 0; Less than 25 years, traditional-age = 1
Gender	Female = 0; Male = 1
Ethnicity	Black = 0; White = 1
Academic Intent	Occupational major = 0; Transfer major = 1
Financial Aid Eligibility	Not eligible = 0; Eligible = 1
When Initially Enrolled	Continuous variable recorded as a whole number of days; ranged from +154 to – 29 days
Number of Course Changes	Continuous variable recorded as a whole number of behaviors; ranged from 0 to 19
Type of course changes	
# of Drops	Continuous variable recorded as a whole number of instances; ranged from 0 to 10
# of Adds	Continuous variable recorded as a whole number of instances; ranged from 0 to 9
# of Section Changes	Continuous variable recorded as a whole number of instances; ranged from 0 to 5
When Course Changes Were Made	Continuous variable recorded as the proportion of changes made early during the add-drop period
Attrition	Not enrolled for Spring semester = 0; Enrolled for Spring semester = 1

Student Characteristics

Characteristic	Fall Cohorts (n) 1994	1995	1996	Sample n	Sample %
Age					
Traditional	407	400	387	1,194	87.47
Nontraditional	66	61	44	171	12.53
Gender					
Female	286	270	221	777	56.92
Male	187	191	210	588	43.18
Ethnicity					
Black	31	43	34	108	8.83
White	342	394	378	1,114	91.17
Academic Intent					
Occupational	168	190	159	517	37.87
Transfer	305	271	272	848	62.13
Financial Aid Eligibility					
Not eligible	250	251	287	788	57.72
Eligible	223	210	144	577	42.28

Summary of Significant Relationships Between Student Characteristics and Enrollment and Registration Behaviors

	When Initially Enrolls	Total Number of Changes	Types of Changes			When Changes are Made
			Drops	Adds	Section Change	
Age (n = 1,365)	.001					
Gender (n = 1,365)	.005				.05	.001
Ethnicity (n = 1,222)	.001		.05			.005
Academic Intent (n = 1,365)	.001			.05		
Financial Aid Eligibility (n = 1,365)	.001					.001

Summary of Significant Findings: Enrollment and Registration Behaviors and Student Characteristics as Predictors of Student Academic Outcomes

	When Initially Enrolls	Total Number of Changes	Types of Changes			When Changes are Made	Student Characteristics				
			Drop	Add	Section Change		Age	Gender	Race	Intent	Fin Aid Eligibility
GPA (n = 917) (n = 816)	.002**		-.221** -.208**	.165** .157**		.467** .485**	.522**	-.199*	.418**	.307**	-.216*
Course Completion (n = 1.053) (n = 924)	.001** .001**		-.122** -.120**	.077** .074**		.228** .223**			.149**		.057*
Attrition (n = 1,053) (n = 932)	1.012*** 1.013**		.493*** .498**	1.603*** 1.528**							

*p < .01 **p < .001 ***p = .000

Multiple Regression Model Summary for GPA by Enrollment and Registration Behaviors With Student Characteristics Held Constant (n = 816)

Model	R	R Square	Std Error of Estimate	F	df	Sig.
1 [a]	.321	.103	1.007	18.61	5, 810	.000
4 [d]	.487	.237	0.930	31.42	8, 807	.000

[a]Predictors: (Constant), AGE_CAT, GENDER, RACE, INTENT, FIN_AID

[d]Predictors: (Constant), AGE_CAT, GENDER, RACE, INTENT, FIN_AID, RLY_S_CH, DROPS, ADDS

Regression Coefficients for Model 4

Variable	B	SE B	ß	t
(Constant)	2.876	.148		19.417**
AGE_CAT	0.522	.104	.166	5.009**
GENDER	-0.199	.068	-.093	-2.926*
RACE	0.418	.114	.115	3.673**
INTENT	0.307	.070	.141	4.370**
FIN_AID	-0.216	.072	-.100	-2.991*
RLY_S_CH	0.485	.092	.194	5.246**
DROPS	-0.208	.027	-.307	-7.716**
ADDS	0.157	.032	.216	4.875**

*p < .01. **p < .001.

Comparison of Enrollment and Registration Behaviors for Attrition Subgroups

Behavior	Attrition Sub-group	n	M	SD	t
When initially Enrolled	0	274	69.86	53.06	-8.216***[a]
	1	1,091	98.68	47.08	
Total # of Changes					
	0	274	4.18	3.16	8.156***[a]
	1	1,091	2.47	2.80	
# of Course Drops					
	0	274	3.03	2.14	12.401***[a]
	1	1,091	1.32	1.53	
# of Course Adds					
	0	274	0.88	1.39	0.578
	1	1,091	0.82	1.32	
# of Section Changes	0	274	0.27	0.69	-0.995
	1	1,091	0.32	0.75	
Proportion of early Changes	0	247	0.32	0.34	-8.591***[a]
	1	806	0.54	0.43	

Note. 0 = Did not enroll for spring semester;
1 = Did enroll for spring semester

[a]An adjusted t value was reported based on unequal variances of the subgroups.

***p < .001.

Summary of Research Findings

- **Significant relationships were found between several student characteristics and enrollment and registration behaviors. (11 out of 30 pairs of variables were related)**

- **Significant interrelationships among the enrollment and registration behaviors were found. (12 out of 15 pairs of variables were related)**

- **Significant interrelationships among the academic outcomes were found. (3 out of 3 pairs of variables were related)**

- **A combination of 4 enrollment and registration behaviors could predict 37.6% of the variation in fall semester GPA. (1 - When student made changes to the schedule, 2 - # of course drops, 3 - # of course adds, and 4 - When student initially enrolled)**

- **A combination of 4 enrollment and registration behaviors could predict 48.6% of the variation in course completion. (1 - When student made changes to the schedule, 2 - # of course drops, 3 - # of course adds, and 4 - When student initially enrolled)**

- **A combination of 3 enrollment and registration behaviors was included in a model that could best predict the odds of attrition. (1 - # of course drops, 2 - When student initially enrolled, and 3 - # of course adds)**

Summary of Research Findings (continued)

- **While controlling for student characteristics, a combination of 3 enrollment and registration behaviors could predict 13.7% of the variation in GPA beyond the 10.3% predicted by student characteristics.**
  (1 - When student made changes to the schedule, 2 - # of drops, and 3 - # of adds)

- **While controlling for student characteristics, a combination of 4 enrollment and registration behaviors could predict 43.9% of the variation in course completion beyond the 10.3% predicted by student characteristics.**
  (1 - # of drops, 2 - When student made changes to the schedule, 3 - # of adds, and 4 - When student initially enrolled)

- **While controlling for student characteristics, a combination of 3 enrollment and registration behaviors were included in a model that could best predict the odds of attrition.**
  (1 - # of drops, 2 - When student initially enrolled, and 3 - # of adds)

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