Towards A Comprehensive Predictive Model of Time to Bachelor's Degree Attainment

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CONTENTS

ABSTRACT

The study investigates the effects of a complex suite of variables (student background characteristics, remedial course and summer freshman program participation, enrollment behaviors, student experiences and perceptions, financial aid data, and academic outcomes) on time-to-degree using a structural equation modeling approach. Average student credit hour load per term, summer term enrollment, transfer credit hours, and number of failed courses were among the strongest predictors of total terms enrolled and total terms elapsed prior to graduation. Implications for academic advising concerning student course loads, the mixed implications for the role of financial aid, speculation over the negligible role of student experience and perception variables on time-to-degree, and recognition that timely degree completion is only one of several (sometimes conflicting) desirable student outcomes are discussed.

BACKGROUND

Concerns over the seemingly ever-increasing cost of undergraduate education, even within the public sector, on the part of students, parents, governmental agencies, and the media, accompanied with institutional sensitivity about efficient student use of scarce resources point to the need for decreasing undergraduates' time to Bachelor's Degree attainment (Adelman, 1999; Astin, Tsui, & Avalos, 1996; Volkwein & Lorang, 1996). A readily apparent example of federal government concern with this problem is the existence of the IPEDS Graduation Rate Survey. Several states such as Florida, Louisiana, Ohio, and South Carolina, have linked graduation rates to performance funding initiatives. A recent development in Ohio is the availability to state universities of Success Challenge funds, which rewards them for the timely degree completion of undergraduates.

A number of sources, relying upon national data, have concluded that five years of elapsed time to Bachelor's Degree completion, rather than the traditionally recognized four, has become the de facto average. The National Center for Educational Statistics High School and Beyond longitudinal study indicated 57 months as mean time-to-degree (Adelman, 1999). Numerous anecdotal reasons are offered for increased time-to-degree: more students are attending part-time, more are transferring between institutions, more are employed while attending college, a greater percentage need remedial course work, etc. Educational authorities and state legislatures have also begun to question whether lengthened time-to-degree is the fault of malingering students or of the institutions themselves through practices such as poor advising, insufficient class availability, and a proliferation of degree requirements. Higher education governing boards including those of Oregon (cited in Volkwein & Lorang, 1996) and Texas (Texas Higher Education Coordinating Board, 1996) have proposed policies to address increased time-to-degree, notably in the absence (at least initially) of reliable research.

While a plethora of research exists concerning college student first to second year retention, far fewer studies have been published concerning effects upon time-to-degree. Adelman (1999) found that students who exhibited no "stop out" behavior, did not transfer between institutions, had higher freshman grade point averages, were enrolled for a larger number of classes per term, withdrew from fewer courses or took fewer grades of "incomplete," and who were female graduated more quickly. The California State Postsecondary Education Commission (1988) related time-to-degree to students' financial need, employment, and class loads. Duby and Schartman (1997) concluded that students who initially were enrolled for more classes per term graduated more quickly. The major finding of Hall's (1999) study was that "extender" students (those for whom time-to-degree was increased) took fewer classes per term. Knight (1994) noted that students with higher cumulative grade point averages at graduation, fewer total credit hours earned, fewer courses dropped, and higher SAT scores graduated more quickly. Lam (1999) studied both total terms enrolled and total terms elapsed (including "stop out") for graduates; he found full-time enrollment, higher grade point average at graduation, being an out-of-state student, being female, changing majors fewer times, percent of loan dollars in relation to students' total financial aid package, not being employed, and being a student of color to be predictive of more rapid degree completion. Noxel and Katunich (1998) spotlighted the role of greater student institutional commitment as facilitating more rapid degree completion. The Oklahoma State Regents for Higher Education (1996) associated transfer, class load per term, and major-changing behavior with time-to-degree.

While shedding important light on the issue, most of these studies have examined a narrow set of time-to-degree predictor variables and most have done so in a simple descriptive fashion or by using multiple regression. A more comprehensive approach might yield a more robust set of results. A study concerning primarily traditionally-aged, full-time, non-transfer students at a residential university (where one might surmise students' chance of timely degree completion is greatest) might also prove particularly interesting. One notable study which used multiple data sources (including student self-reported reasons for extending their time-to-degree) and multiple methods to study this

issue was that of Volkwein and Lorang (1996). That study found that lower class loads per term, receiving financial aid in the form of grants, and higher grade point averages were associated with longer time-to-degree. Additionally, the study revealed that students extended their time-to-degree to give them more free time and to protect their grades. The Volkwein and Lorang (1996) study was limited, however, to full-time students at one research university whose time-to-degree on average was relatively brief. Measures of entering student academic ability, data on major-changing behavior, and data from students who were admitted under special programs were also lacking from that study.

The purpose of this research is to study effects upon time to Bachelor's Degree attainment for students at Bowling Green State University, using methods which overcome many of the limitations of the previous works cited and to extend this line of inquiry by studying the effects of a complex suite of variables on undergraduate time-to-degree (both total terms enrolled and total terms elapsed).

METHODOLOGY

Qualitative Phase of the Study

In an initial exploratory phase of the study, an e-mail message was sent to a random sample of 500 (approximately one-third of the) May 1999 baccalaureate graduates, asking the following question: "If it has taken you longer than expected to graduate, why do you think this is the case and what can Bowling Green State University do to ensure that students graduate in a timely manner?" This activity was carried out as an attempt to expand the list of possible predictor variables of time-to-degree which would be used in the analytical phase of the study. One hundred eighteen replies were received, with most respondents noting that since they were graduating in four years, they had no reasons to offer for extended time-to-degree. Poor academic advising was cited most frequently as a reason for extended time-to-degree by the students offering reasons.

Characteristics of the Population

The study examined influences upon time-to-degree for the entire population of BGSU students earning Bachelor's Degrees in 1998-1999. Fifty-nine percent of the population was female, two percent were students of color, and 94% were state residents. Average high school grade point average for the population was 3.01 and average ACT composite score was 22.1. Two percent of the population participated in the Summer Freshman Program, which provides special services to new students who would otherwise be inadmissible due to their academic credentials. Twelve percent were enrolled in the university's remedial reading course, 10% in remedial English, and 9% in remedial mathematics. Slightly less than 1% of the students took advantage of the university's Academic Forgiveness Program, which permits students returning to the institution after a period of at least five years away to have their grade point averages calculated from the point of readmission without losing credit for previous coursework with a grade of "C" or better.

For purposes of this study, students' major areas of study were grouped into areas corresponding either to colleges within the University or divisions within the College of Arts and Sciences. Approximately 14% of the students graduated in Business Administration, 28% in Education and Human Development, 13% in Health and Human Services, 4% in Technology, 8% in mathematics and sciences, 9% in social sciences, 3% in humanities, 6% in arts, and 10% in communications. A final 5% of the students had majors in liberal studies or individually-planned programs; their majors were not included in the study. Mean semesters of enrollment to degree attainment and semesters elapsed to degree attainment by major is shown in Table 1.

Sixty-nine percent of the students graduated in programs whose curricula were subject to the influence of accreditation standards. Ten percent graduated with double majors and 33% graduated with one or more minors. Nineteen percent of the students enrolled in at least one cooperative education course and 8% completed two or more. Seventy-five percent of the students were enrolled for at least one summer semester; 42% were enrolled in two or more, and 16% were enrolled in three or more summer terms. Seventy-three percent changed their major at least once; 27% changed twice or more, and 8% changed three or more times. Thirty-nine percent of the population retook at least one course; 21% withdrew from at least one course, and 37% failed at least one course. One percent of the students participated in the University's honors program. Students on average earned 39 credit hours in general education courses and earned a mean grade point average within general education of 2.89 on a 4.00 scale. The average credit hours students completed per semester was 14.0. Students graduated with a mean cumulative grade point average of 3.07 and with an average of 136.8 credit hours total; 18% graduated with honors.

Median semesters of enrollment to degree (including summers) for the population was 10. Median semesters elapsed (including "stop out" semesters) from matriculation to graduation was 14. This corresponds to approximately five years of enrollment.

Transfer students (N=264) were excluded from the population; 2,585 remaining students constituted the population for the remainder of the analyses. These students were excluded since significant differences between transfer and "native' students were found in both total semesters enrolled and semesters elapsed to degree (7.8 semesters enrolled for transfer students vs. 10.3 semesters for native students and 9.9 semesters elapsed for transfer students vs. 13.9 semesters for native students) and also to allow greater comparability to most previously published studies.

Table 1: Time to Degree by Major for 1998-99 Graduates

Major	Number of Graduates	Average Semesters Enrolled	Average Semesters Elapsed
College of Arts and Sciences			
B.S.J. History	2	8.5	11.0

B.S.J. Magazine Journalism	3	9.3	14.0
B.S.J. News-Editorial	9	9.3	18.1
B.S.J. Photojournalism	2	9.0	11.5
B.S.J. Public Relations	24	9.3	11.6
B.S.J. Broadcast Journalism	10	9.0	11.7
B.S.J. Print Journalism	1	8.0	11.0
B.S.J. Visual Journalism	1	7.0	9.0
B.F.A. Graphic Design	37	10.1	13.6
B.F.A. Two Dimensional Studies	38	10.9	15.1
B.F.A. Three Dimensional Studies	15	11.4	16.1
B.F.A. Art	1	8.0	11.0
B.F.A. English	2	9.5	10.5
B.F.A. Creative Writing	12	9.4	11.5
B.S. Ind. Planned Program	4	10.8	17.0
B.S. Biology	86	9.0	11.7
B.S. Statistics	2	8.0	11.0
B.S. Chemistry	9	9.4	10.0
B.S. Computer Science	59	9.9	12.3
B.S. Scientific & Technical Comm.	1	9.0	10.0
B.S. Environmental Science	29	9.5	13.5
B.S. Geology	5	9.5	11.8
B.S. Mathematics	10	9.0	11.7
B.S. Physics	1	9.0	12.0
B.S. Psychology	12	8.5	11.4
B.A. Ind. Planned Program	34	11.4	15.6
B.A. American Culture Studies	2	9.5	13.5
B.A. Art	1	15.0	17.0
B.A. Art History	5	10.6	18.8
B.A. Asian Studies	2	11.0	14.5
B.A. Classical Civilization	1	14.0	29.0
B.A. Computer Science	1	10.0	11.0
B.A. Economics	4	10.3	13.0
B.A. English	21	9.6	12.5
B.A. Scientific & Tech. Comm.	11	10.0	13.9
B.A. Env. Policy & Analysis	26	10.8	15.1
B.A. Ethnic Studies	6	14.0	14.3
B.A. Film Studies	7	9.7	13.1
B.A. French	5	9.8	12.8
B.A. Fashion Merchandizing	20	9.9	12.8
B.A. Interior Design	18	11.4	16.6
B.A. Apparel Design and History	1	13.0	18.0
B.A General Studies in Business	26	11.8	15.2
B.A. Geography	9	10.1	14.3
B.A. German	7	8.4	10.4
B.A. History	22	9.4	12.5
B.A. International Studies	5	9.6	12.6

B.A. Music	4	12.8	21.3
B.A. Philosophy	4	10.5	13.0
B.A. Political Science	33	9.2	13.3
B.A. Popular Culture	7	11.5	19.1
B.A. Psychology	76	9.6	13.9
B.A. Interpersonal Comm.	30	11.4	15.5
B.A. Sociology	49	9.6	13.6
B.A. Spanish	4	9.5	33.8
B.A. Womens Studies	4	12.0	16.5
B.A. Telecommunications	11	9.1	12.6
B.L.S	25	11.6	17.5
B.A.C. Film Studies	1	11.0	14.0
B.A.C. Interpersonal Comm.	108	9.6	12.3
B.A.C. Theatre	11	11.2	16.0
B.A.C. Telecommunications	32	9.2	15.3

College of Business Administration

BSBA Accounting	65	10.1	13.8
BSBA Info. Sys. Auditing/Control	5	10.6	12.2
BSBA Business Pre-Law	3	8.0	11.3
BSBA Economics	4	14.3	21.8
BSBA Finance	42	9.5	12.7
BSBA General Business	15	12.4	20.3
BSBA Health Care Administration	11	11.8	14.6
BSBA Hospitality Management	8	10.9	12.3
BSBA Management Info. Systems	40	10.5	12.9
BSBA Industrial/Labor Relations	2	11.0	21.0
BSBA Prod./Operations Mgmt.	50	11.0	13.1
BSBA International Business	40	10.0	12.4
BSBA Administrative	4	10.3	12.8
Management	11	9.6	12.0
BSBA Human Resource Mgmt.	1	11.0	13.0
BSBA Purchasing/Materials	65	9.4	12.1
Mgmt.	6	11.2	17.7
BSBA Marketing			
B.S. Economics			

College of Education and Human Development

B.S. Apparel Merch./Product Dev.	10	9.5	11.8
B.S.Ed. Art Education	11	9.7	13.3
B.S.Ed. Biology	18	10.9	14.1
B.S.Ed. Business Education	9	13.3	34.0
B.S.Ed. Chemistry	1	10.0	14.0
B.S.Ed. Communications	21	9.3	11.6
B.S.Ed. Computer Science	3	9.0	12.7

B.S.Ed. Child & Family Dev.	10	10.2	13.0
B.S.Ed. Dance	4	9.5	11.5
B.S.Ed. Early Childhood	11	10.5	13.3
Education	1	10.0	13.0
B.S.Ed. Earth Science	211	9.9	13.1
B.S.Ed. Elementary Education	2	13.0	15.5
B.S.Ed. Physical Educ.-Elem.	19	11.0	15.4
B.S.Ed. English	2	9.5	12.5
B.S.Ed. German	4	9.5	12.3
B.S.Ed. Human Movement	13	11.2	13.8
Science	20	10.7	13.4
B.S.Ed. Health Promotion	2	11.0	13.5
B.S.Ed. Exercise Speciaist	3	11.7	13.7
B.S.Ed. Sport Specialist	12	10.9	14.8
B.S.Ed. Health Education	3	9.0	11.7
B.S.Ed. Physical Educ.-Secondary	1	12.0	11.7
B.S.Ed. History	6	10.2	12.8
B.S.Ed. Phys. Educ./Health/Coach.	5	9.2	11.2
B.S.Ed. Family & Cons. Sci. Educ.	4	11.0	12.5
B.S.Ed. Technology Education	22	9.9	17.1
B.S.Ed. Marketing Education	39	10.4	13.9
B.S.Ed. Mathematics	2	11.0	13.5
B.S.Ed. Recreation	10	11.3	16.2
B.S.Ed. Psychology/Sociology	59	10.4	13.3
B.S.Ed. Science Comprehensive	34	10.1	14.1
B.S.Ed. Sport Management	7	9.0	12.7
B.S.Ed. Social Studies	109	10.3	13.4
B.S.Ed. Spanish	2	10.0	32.5
B.S.Ed. Special Education	25	10.8	14.2
B.S.Tech. Rest./Instit. Food Serv. .	9	10.2	12.6
B.S. Child & Family Comm. Svcs.			
B.S. Interior Design			

College of Health and Human Services

B.S. Nursing	91	9.1	11.8
B.S. Art Therapy	13	10.8	17.5
B.S. Physical Therapy	22	11.8	14.1
B.A. Allied Health	1	3.0	12.0
B.A. Health Science	13	9.4	11.9
B.S. Applied Microbiology	8	10.0	12.4
B.S. Dietetics	23	10.5	12.9
B.S. Environmental Health	14	11.1	15.1
B.S. Gerontology	10	9.2	13.9
B.S. Medical Technology	10	10.2	21.4
B.S. Social Work	34	10.3	14.4
B.S. Criminal Justice	26	9.6	11.5

B.S. Communication Disorders	57	9.2	11.8
College of Musical Arts			
B.M. Music Composition	1	9.0	13.0
B.M. Music Education	41	10.5	13.1
B.M. Music Performance	11	9.4	19.2
College of Technology			
B.S.Tech. Design Technology	1	16.0	53.0
B.S.Tech. Aviation Studies	14	11.0	12.5
B.S.Tech. Advanced Tech. Info.	1	9.0	7.0
B.S.Tech. Electronics/Comp.	8	12.5	16.6
Tech.	14	12.7	15.0
B.S.Tech. Architectural/Env. Design	5	10.8	12.8
B.S.Tech. Mechanical Design			

Methods

The underlying theoretical framework for the study was the college-student impact model typified by Astin (1970), Pascarella (1985), Tinto (1975, 1987), and Weidman (1989). Total elapsed semesters to degree attainment and total semesters enrolled served as dependant or "downstream" variables in two separate analyses. The influence of categories of predictor variables (student background characteristics, remedial course and summer freshman program participation, pre-enrollment perceptions, enrollment behaviors, student experiences and perceptions, financial aid data, and academic outcomes), both upon one another and upon the dependant variables, were tested using the SPSS AMOS structural equation modeling program within the framework of a structural model which was developed through a combination of theoretical and empirical approaches. The influence of each vertical column of variables shown in Figures 1 and 2 upon columns of variables to their right in the research model and also directly upon the dependant variables was tested using critical ratios to determine the significance of regression parameters.

Data on students' time-to-degree, demographic and pre-college educational characteristics, remedial course and summer freshman program participation, enrollment behavior variables, and academic outcomes were assembled into a series of data files by the University's Office of Registration and Records. These were merged with student financial aid data and data resulting from two questionnaires administered by the University's Office of Institutional Research: a first year student questionnaire which collects data upon students' pre-enrollment perceptions and an undergraduate experiences questionnaire which collects data upon college experiences and perceptions. A detailed listing of significant and non-significant predictor variables is provided in Tables 2 and 3, respectively.

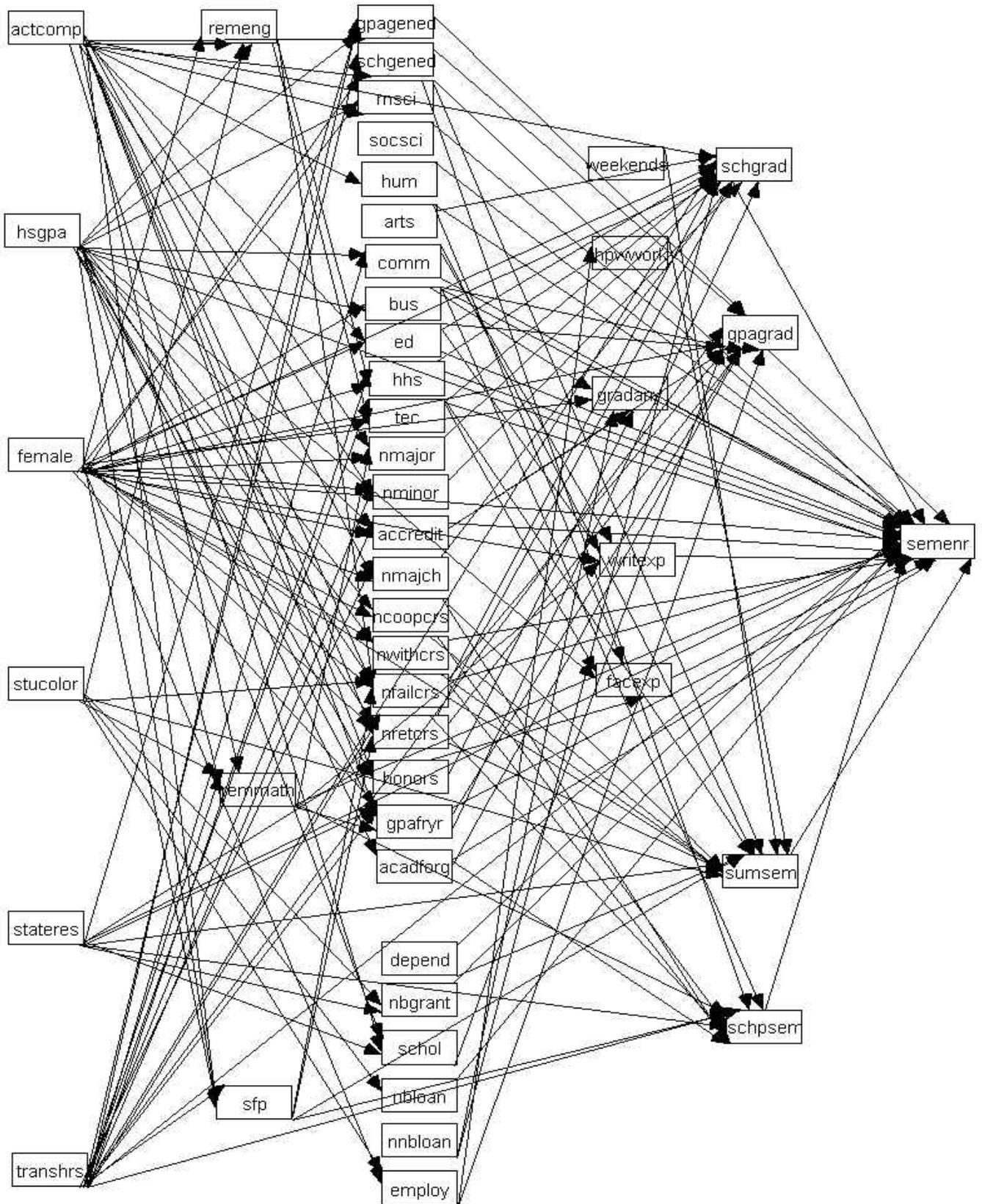# Figure 1: Effects Upon Semesters Enrolled to Degree
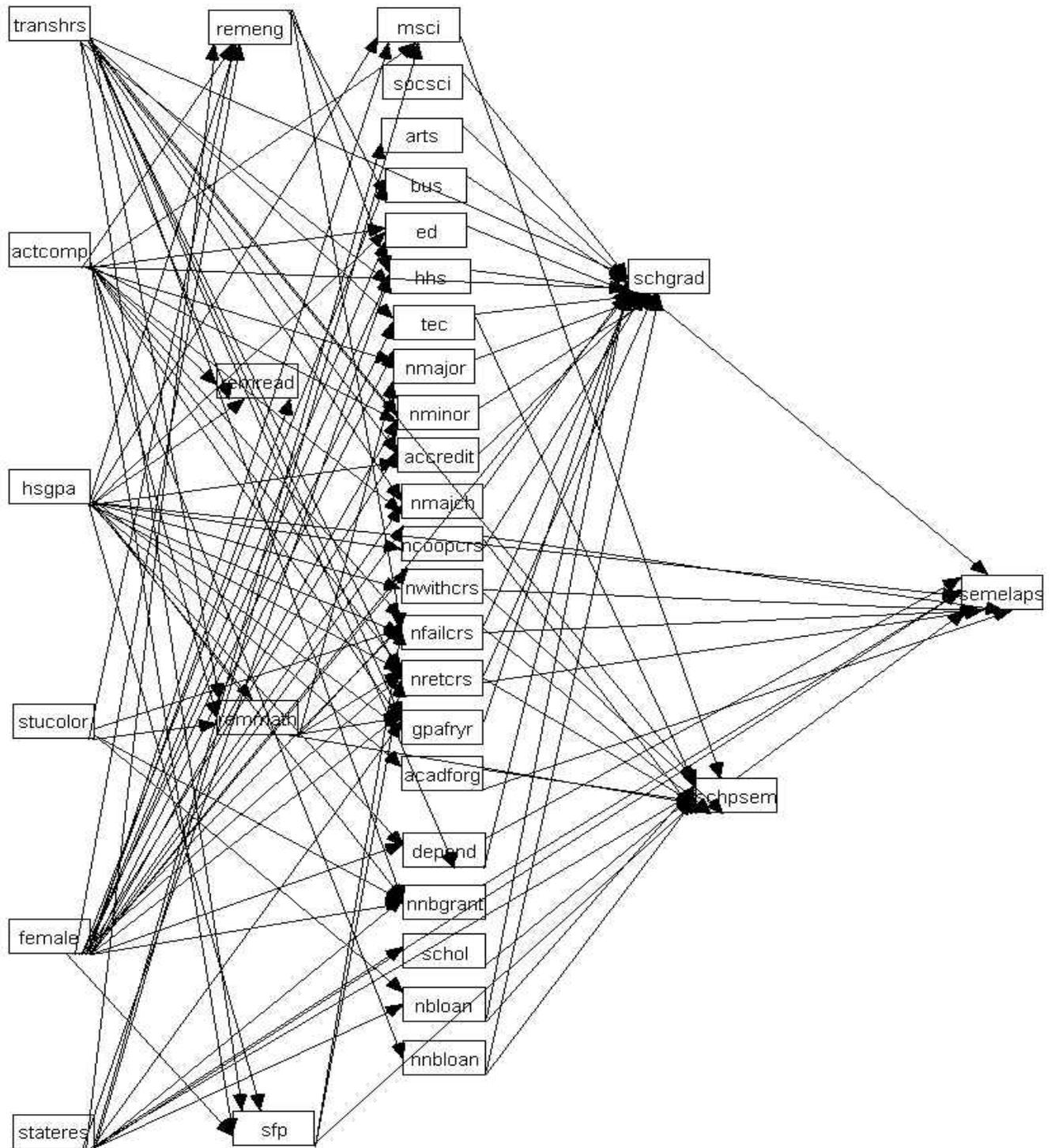
Figure 2: Effects Upon Semesters Elapsed to Degree

Table 2: Significant Predictor Variables in the Research Models

Variable	Description
Demographic and Pre-College Educational Variables	
ACT Composite Score	
High School Grade Point Average	
Gender	Dummy-Coded as Female = 1, Male = 0
State Resident	Dummy-Coded as State Resident = 1, Non-Resident = 0
Student of Color	Dummy-Coded as American Indian, Asian, Black, or Hispanic = 1, White = 0
Transfer Hours	Student Credit Hours Earned by Advanced Placement, College Level Examination Program, Dual High School and College Enrollment, or Transient Enrollment at Another Institution
Remedial Course and Summer Freshman Program Participation	
	Dummy-Coded as Enrolled = 1, Not Enrolled = 0
Remedial English	Dummy-Coded as Enrolled = 1, Not Enrolled = 0
Remedial Mathematics	
Remedial Reading	Dummy-Coded as Enrolled = 1, Not Enrolled = 0
Summer Freshman Program	Dummy-Coded as Enrolled = 1, Not Enrolled = 0
Enrollment Behaviors	
Academic Forgiveness Program Participation	Dummy-Coded as Yes = 1, No = 0
Cumulative Grade Point Average in General Education Classes	
Cumulative Grade Point Average at the End of the First Year	
Honors Program Participation	Dummy-Coded as Yes = 1, No = 0
Major: Arts	Dummy-Coded as Yes = 1, No = 0
Major: Business	Dummy-Coded as Yes = 1, No = 0
Major: Communications	Dummy-Coded as Yes = 1, No = 0
Major: Education	Dummy-Coded as Yes = 1, No = 0
Major: Health and Human Services	Dummy-Coded as Yes = 1, No = 0
Major: Humanities	Dummy-Coded as Yes = 1, No = 0
Major: Math and Science	Dummy-Coded as Yes = 1, No = 0

Major: Social Sciences	Dummy-Coded as Yes = 1, No = 0
Major: Technology	Dummy-Coded as Yes = 1, No = 0

Number of Majors at Graduation
Number of Minors at Graduation
Number of Courses From Which the Student Withdrew
Number of Courses the Student Failed
Number of Courses the Student Repeated
Number of Cooperative Education Courses Completed
Number of Times the Student Changed Majors
Total Credit Hours Earned in General Education Courses

College Experiences and Perceptions (From Undergraduate Experiences Questionnaire)

Faculty Experiences	10-Item Scale, a= .85
Hours per Week Studying	5-Point Likert-Type Item
Hours per Week Working	5-Point Likert-Type Item
Importance of Graduating From College	4-Point Likert-Type Item
Number of Weekends per Month Spent on Campus	6-Point Likert-Type Item
Writing and Learning Resources Experiences	10-Item Scale, a = .85

Financial Aid Variables

Financial Aid Dependant Status	1 = Dependant, 0 = Independent,
	Average of 1996-97, 1997-98, 1998-99
Campus Employment Aid Dollars Disbursed	Average of 1996-97, 1997-98, 1998-99
	Average of 1996-97, 1997-98, 1998-99
Need-Based Grant Aid Dollars Disbursed	Average of 1996-97, 1997-98, 1998-99
	Average of 1996-97, 1997-98, 1998-99
Need-Based Loan Aid Dollars Disbursed	Average of 1996-97, 1997-98, 1998-99
Non-Need-Based Grant Aid Dollars Disbursed	
Non-Need-Based Loan Aid Dollars Disbursed	
Scholarship Aid Disbursed	

Academic Outcomes

Average Student Credit Hours per Semester
Cumulative Grade Point Average at Graduation
Number of Summer Semesters Enrolled
Total Credit Hours Earned at Graduation

Table 3: Non-Significant Predictor Variables in the Research Models

Variable	Description
Pre-Enrolment Perceptions From First Year Student Questionnaire	
Anticipated College Activities (e.g., Change My Major, Graduate With Honors, etc.)	
Anticipated Need for Remedial Classes in Various Subjects	
Highest Degree Aspired to at Any University	
Highest Degree Aspired to at This University	
Parents' Annual Income	
Parents' Highest Education Levels	
Self-Described Abilities (e.g., Creativity, Leadership Ability, etc.)	
This University Represented My First Choice, Second Choice, etc.	
Years of High School Courses Completed in Various Subjects	
College Experiences and Perceptions From Undergraduate Experiences Questionnaire	
Career Gains	3-Item Scale, a = .83
General Education Gains	4-Item Scale, a = .70
Inquiry Gains	4-Item Scale, a = .84
Interaction Gains	6-Item Scale, a = .84
Satisfaction	19-Item Scale, a = .96
Satisfaction with Class Availability	4-Point Likert-Type Item
Class Experiences	10-Item Scale, a = .81
Conversations	16-Item Scale, a = .91
Experiences with Other Students	10-Item Scale, a = .90
Student Organizations	10-Item Scale, a = .89
Institutional Cynicism	13-Item Scale, a = .77
Perceived Institutional Emphasis	6-Item Scale, a = .88
Perceived Relational Environment	4-Item Scale, a = .77
Financial Aid Variables	
Unmet Need Dollars	Average of 1996-97, 1997-98, 1998-99
Academic Outcomes	
Graduation with Honors	Dummy-Coded as Yes = 1, No = 0
Ratio of Student Credit Hours Earned at Graduation to Minimum Hours Required for Degree	

RESULTS

Tables 4 and 5 show the results for effects upon semesters enrolled to degree completion and semesters elapsed, respectively. Standardized direct, indirect, and total effects are shown, rank ordered by total effect size. All direct effects show are statistically significant at the $p < .05$ level.

The first research model explained 81% of the variance in semesters enrolled to degree completion. The strongest predictors were mostly among those classified as academic outcomes and enrollment behavior variables: average credit hour load per semester, total credit hours at graduation, number of summer semesters enrolled, transfer credit hours, number of failed, cooperative education, withdrawn, and repeated courses, and participation in the Academic Forgiveness Program.

The second research model explained 43% of the variance in total semesters elapsed to degree completion. The strongest predictors were participation in the Academic Forgiveness Program, average credit hour load per semester, number of failed courses, total credit hours at graduation, high school grade point average, dependant financial aid status, and transfer credit hours.

It is also important to note the non-significant effects upon time-to-degree. These included (as listed in Table 3) dollar volume of student financial need unmet through institutional aid, graduation with honors, the ratio of student credit hours earned at graduation to the minimum hours required in the student's degree program, almost all of the college experience and perceptions variables taken from the undergraduate experiences questionnaire, and all of the pre-college perceptions variables taken from the first year student questionnaire.

Table 4: Decomposition of Standardized Effects on Semesters Enrolled to Degree (R^2=.811)

Predictor Variables	Direct Effect	Indirect Effect	Total Effect	Rank
Average SCH/Semester	-.497		-.497	1
Total SCH at Graduation	.418		.418	2
Summer Semesters Enrolled	.300		.300	3
Transfer SCH	-.121	-.169	-.290	4
Number of Failed Classes		.175	.269	5
Number of Cooperative Education		.161	.161	6
Courses	.078	.078	.124	7
Number of Withdrawn Courses		.116	.116	8
Number of Repeated Courses	.069	.041	.110	9
Academic Forgiveness Program	-.045	-.051	-.096	10
Dependant Financial Aid Status	-.032	-.064	-.096	10
High School GPA		.095	.095	11

Summer Freshman Program	-.027	-.059	-.086	12
Gender (Female)	-.068	-.013	-.081	13
Major Area: Communications	.022	.056	.078	14
State Resident		-.077	-.077	15
ACT Composite Score	-.034	-.043	-.077	15
Major Area: Math and Science		.076	.076	16
Number of Majors	-.144	.220	.076	16
Major Area: Education	-.027	.102	.075	17
Major Area: Technology	-.067		-.067	18
Major Area: Social Sciences	.056		.056	19
Cumulative GPA at Graduation		.055	.055	20
Number of Major Changes	-.039	.081	.042	21
Major Area: Health & Human	-.038	-.004	-.042	21
Services	-.090	.050	-.040	22
Major Area: Business	-.036		-.036	23
GPA Freshman Year		.033	.033	24
Major Area: Humanities	.019	.014	.033	24
Ethnicity (Student of Color)	.029	.003	.032	25
Remedial Math	-.032		-.032	25
Major Accredited	-.047	.074	.027	26
Faculty Experiences	.027	.027	.027	26
Major Area: Arts	.026	.026	.026	27
Writing and Learning Resources	-.026	-.026	-.026	27
Experiences		.024	.024	28
Need-Based Loan $ Disbursed	-.022		-.022	29
Importance of Graduating from Any		.018	.018	30
Institution		-.016	-.016	31
Number of Minors		.014	.014	32
Need-Based Grant $ Disbursed		.013	.013	33
Hours/Week Working		.013	.013	33
Weekends Spent on Campus		-.003	-.003	34
GPA in General Education Courses		.003	.003	34
		.002	.002	35
Remedial English		-.002	-.002	35
Non-Need-Based Loan $ Disbursed				
Honors Program				
Scholarship $ Disbursed				
On-Campus Employment $ Disbursed				
SCH in General Education Courses				

Table 5: Decomposition of Standardized Effects on Semesters Elapsed to Degree (R^2=.434)

Predictor Variables	Direct Effect	Indirect Effect	Total Effect	Rank
Academic Forgiveness Program	.324	.028	.352	1
Average SCH/Semester	-.344		-.344	2
Number of Failed Courses	.197	.072	.269	3
Total SCH at Graduation	.239		.239	4
High School GPA	-.133	-.085	-.218	5
Dependant Financial Aid Status	-.091	-.024	-.115	6
Transfer SCH		-.104	-.104	7
Major Area: Education		.077	.077	8
State Resident	.035	.041	.076	9
Number of Withdrawn Courses	.052	.018	.070	10
Major Area: Technology		.055	.055	11
Number of Majors		.045	.045	12
Summer Freshman Program		.042	.042	13
Non-Need-Based Grant $ Disbursed	-.040		-.040	14
Gender (Female)		-.036	-.036	15
Need-Based Loan $ Disbursed		-.032	-.032	16
Number of Major Changes		.032	.032	16
Major Area: Arts		.030	.030	17
Remedial Math		.030	.030	17
Number of Repeated Courses	-.095	.067	-.028	18
Major Area: Health & Human Services		.027	.027	19
		-.026	-.026	20
ACT Composite Score		-.023	-.023	21
Major Area: Business		.017	.017	22
Major Accredited		-.015	-.015	23
Major Area: Math and Science		.013	.013	24
		-.014	-.014	25
GPA Freshman Year		.012	.012	26
Scholarship $ Disbursed		-.011	-.011	27
Number of Minors		.009	.009	28
Major Area: Social Sciences	-.054	.047	-.008	29
Remedial English		.005	.005	30
Number of Cooperative Education Courses		-.002	-.002	31
Ethnicity (Student of Color)				
Non-Need-Based Loan $ Disbursed				

Subsequent analyses explored the distribution of graduates across ranges of average credit hour load per semester and grade point average at graduation as well as the percentage of these who graduated in eight semesters/four years. This was done to

investigate the issue of a potential optimum course load for students at different levels of academic achievement (i.e., could an academically marginal student slow his or her time to degree with an inappropriately high course load while a very academically capable student might graduate more rapidly with a higher load?). The conclusion, as shown below in Tables 6 and 7, is that, while large number of students graduate with average credit hour loads of less than 15 SCH/semester, none of these graduate in four years. Further, nearly all students graduate in four years who take an average load of 18+ hours per semester. The majority of students (regardless of GPA range) who take 15-17 SCH/semester graduate in four years and there does not seem to be an obvious relationship between GPA and credit hour load.

Table 6: Distribution of BGSU 1998-99 Baccalaureate Graduates by Average SCH Load per Semester and GPA at Graduation

Graduation GPA	Average SCH per Semester				
	<12	12-14	15-17	18+	Total
< 2.50	144	135	23	28	330
2.50-2.74	122	193	51	34	400
2.75-2.99	100	237	83	43	463
3.00-3.24	68	282	144	74	568
3.25-3.49	45	203	132	74	454
3.50-3.74	26	140	113	83	362
3.75-4.00	16	80	99	76	271
Total	521	1270	645	412	2848

Table 7: Percent of Students Graduating Within Eight Semesters by Average SCH Load per Semester and GPA at Graduation

Graduation GPA	Average SCH per Semester				
	<12	12-14	15-17	18+	Total
< 2.50	0%	0%	65%	100%	13%
2.50-2.74	0%	0%	73%	97%	18%
2.75-2.99	0%	0%	64%	93%	20%

3.00-3.24	0%	0%	53%	91%	25%
3.25-3.49	0%	0%	58%	96%	32%
3.50-3.74	0%	0%	56%	95%	38%
3.75-4.00	0%	0%	72%	95%	53%
Total	0%	0%	61%	94%	27%

CONCLUSIONS AND RECOMMENDATIONS

The finding that average credit hour load per term is a strong predictor of more rapid degree completion confirms that of nearly all of the previous studies cited, but its salience is particularly highlighted in the current study given its large number of predictor variables. The additional finding that transfer credit hours (gained through AP, CLEP, and/or simultaneous high school and college enrollment, and/or through taking courses at other institutions, typically in the summer at an institution near to students' permanent residence), is the only strong predictor of credit hour load per term may suggest the existence of a strong motivational element among some students to graduate as quickly as possible.

Some findings hold few surprises: total credit hours earned is strongly predictive of time-to-degree, as is participation in the Academic Forgiveness Program (which is only open to students who have been away from their studies for at least five years); students with more transfer credit hours graduate more quickly; students who fail, withdraw from, and repeat more courses, and students with lower high school grade point averages, take longer to graduate. One unexpected finding, however, was the positive relationship between number of summer semesters enrolled and longer time-to-degree; while the expected finding might be that taking more summer courses decreases time-to-degree, the reverse was found to be true in the current study. It may be that students are using the summer terms to offset a lower credit hour load during the academic year, to make up for lost time due to changes of major or the need to take remedial classes, to re-take classes from which they previously withdrew or received a low grade, or to complete internships or cooperative education.

Before proceeding with a discussion of the implications of these findings, mention of the limitations of the study are in order. First, while students' satisfaction with course availability did not have a significant effect upon time-to-degree, no objective measure of the University's course availability was available for use in the study. Graduating students in the study represented "survivors;" it may be that those in their cohort who could not enroll in the necessary courses at the desired times were still enrolled or left the university. A second potential limitation of the current study lies in the fact that student financial aid data were only available spanning the last three years of enrollment for the

population; it is possible that a more complete financial aid data set might have altered the results. Finally, reliable, systematic data on non-campus-based student employment (other than student self-estimated hours per week working) were not available.

The current research offers a number of implications for enrollment management, the first of which concerns the need to get students, in appropriate circumstances, to carry heavier credit hour loads as a mechanism to shorten time-to-degree. As Volkwein and Lorang (1996) note, many baccalaureate programs require a student credit hour load of 16-17 or greater per semester for students to graduate in four years without enrolling in summer (this also excludes the need to take remedial or elective courses, change majors, etc.). Yet campus policies allow students to be considered as "full-time" for registration, fee payment, financial aid (federal and state policies come in to play here as well), and other purposes if they enroll with just 12 semester credit hours per term. While a lighter course load may be in the best academic or personal interest of some students, a systematic approach to academic advising that encourages students to take higher course loads when warranted would significantly decrease time to degree attainment for most students. Advising interventions may also help to decrease the number of failed, dropped, or repeated courses.

The study offers mixed implications concerning the role of student financial aid in promoting more rapid time-to-degree. Need-based grants help to decrease semesters enrolled to degree, while they are not a significant predictor of semesters elapsed to degree. Non-need-based grants are not a significant predictor of semesters enrolled to degree, but help to decrease semesters elapsed to degree. Scholarship dollars help to slightly increase semesters enrolled to degree, but to decrease semesters elapsed to degree. Need-based and non-need-based loans serve to slightly increase semesters enrolled to degree, but to decrease semesters elapsed. On-campus employment dollars have a very small positive affect upon semesters enrolled to degree, but are not a significant predictor of semesters elapsed. Students' unmet need (the dollar difference between average costs and a student's financial aid package) is not a significant predictor of either outcome; presumably students found some way to meet this need (perhaps through family, personal resources, bank loans, etc.) to enable them to enroll. While all of the aforementioned effects of financial aid variables had very small effect sizes, having a dependant financial aid status fairly strongly helped to decrease time-to-degree, both semesters enrolled and elapsed.

In parallel with Volkwein and Lorang's findings, most student-college experiences and perceptions, including satisfaction with course availability, were not significant predictors of time-to-degree. The exceptions to this were experiences with faculty and with writing and learning resources, weekends per month spent on campus, hours per week working, and the importance of graduating for semesters enrolled to degree; none of these variables were significant predictors of semesters elapsed to degree. As suggested by Pascarella and Terenzini (1991), academic and social integration may have a particularly salient effect upon first to second year retention, but that influence may dissipate over time and this have less influence upon degree attainment (and time-to-degree). Pascarella and Terenzini's findings about the importance of academic

achievement and the varying effect of major field of study on degree attainment was extended to the outcome of time-to-degree by this work.

The fact that enrollment in cooperative education courses had a relatively strong positive effect upon time-to-degree illustrates the important caveat that timely degree completion is not all that matters in terms of college student outcomes. Both analytical and student self-report evidence supports the fact that enrollment in cooperative education courses, involvement in internships, participation in various "learning community" programs, etc., while perhaps extending time-to-degree, significantly improves student learning and skill development, affective outcomes, career prospects, and the like. Significantly reducing time-to-degree could perhaps demand a trade-off against other long-term (and maybe more important) outcomes. As is often the case in higher education policy and practice, and as has been observed by many, the actions we take and the outcomes we hope to facilitate are ultimately a function of our mission and values.

The Office of Institutional Research offers the following recommendations based upon these results:

1. University-wide discussions should be held about undergraduates' course loads and how, when appropriate, students can be encouraged to increase them.
2. Academic advisors should encourage students, when appropriate, to take higher course loads.
3. University policies (registration, financial aid, etc.) which define full-time enrollment for undergraduates as 12 credit hours should be discussed in light of these findings.
4. BGSU should continue to monitor and improve course availability.
5. Reasons for extended time-to-degree should be discussed with students by a variety of persons within the University.

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