



# Factors that Predict Obtaining a Post Baccalaureate Degree

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This presentation was made at the California Association for Institutional Research Conference on November 19, 2010.

## What?

- Predict obtaining Graduate Degree (Masters or Higher) from UNDERGRADUATE MEASURES
- Predict which Undergraduates will go onto graduate/professional school
- Predict whether students enrolled in graduate/professional school will obtain graduate degree from undergraduate factors

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## Origins of Study

- AN OBSERVATION: Able to reliably identify criterion from National Student Clearinghouse (easier to determine WHO obtains a graduate degree than who goes on to graduate school).
- Availability of CIRP Survey results for large percentage of Saint Mary's populations (results back to 1971).
- Better understand factors that can contribute to student motivation to succeed academically and obtain graduate degree.

## What We Know...

- Approximately 65% of college freshmen indicate an interest in pursuing some form of post-baccalaureate education

(Astin, Parrot, Kom, & Sax, 1997 as cited in Rajecki, Lauer, & Metzner, 1998)

## 1972-2004 HIGH SCHOOL SENIOR EXPECTATIONS

- Surveys conducted in 1972, 1980, and 1992 showed that more high school (HS) seniors expected to end their postsecondary education with a bachelor's degree than a graduate or professional degree
- By 2004, however, a greater proportion of HS seniors expected to earn a graduate or professional degree than with a bachelor's degree.
- Expectations of attaining a graduate degree increased from 13 percent in 1972 to 38 percent in 2004. During the same time period, expectations for finishing with a bachelor's degree showed no difference.

Ingels & Dalton, 2008

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Expectations versus Attainment of Post-Baccalaureate Degrees from the High School Senior's Point of View. Major changes from 1972 through 2004

## College GPA

- College GPA represents an "objective" measure of academic performance that has already been established in the literature as a predictor of future graduate study

Kuncel, Hezlett, & Ones, 2001

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“The most important predictor of future graduate level study is (college) GPA.”

## Gender Differences

- For both males and females, expectations of attaining a graduate or professional degree were higher in 2004 than in 1972. Noticeable differences:
    - In 1972, males expected to earn a graduate or professional degree in greater proportions than females (16 percent versus 9 percent)
    - In 2004, females expected to earn a graduate or professional degree more often than males (45 percent versus 32 percent).
- Ingels & Dalton, 2008
- Females earned 59% of master's degrees in 2003-2004 compared with 49% in 1979-1980. (NCES 2006)

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There are other factors besides College GPA that predict going on to future graduate study. One these is Gender.....

Noticeable differences from 1972 through 2004 found in Gender Differences: Expectations and Aspirations versus Attainment

“In 1972, more males expected to earn a graduate or professional degree than females. By 2004, the trend reversed and more females did.”

## 1972-2004 HS SENIOR – ETHNICITY TRENDS

- Expectations for a graduate or professional degree were higher in 2004 than 1972 for all racial/ethnic groups.
- Asian high school seniors' expectations for a graduate or professional degree, which were lower than Whites' in 1972 (17 percent versus 22 percent), topped the expectations of all other groups in 2004 (at 51 percent) and represented the largest percentage point gain in any group, 35 points.

Ingels & Dalton, 2008

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Ethnicity may be another predictor....

Racial/Ethnic Differences: Expectations and Aspirations for Graduate or Professional Degrees. 1972 versus 2004

“In 2004, expectations were higher for ALL racial groups than in 1972. Most noticeable changes in expectations occurred with Asian students.”

## PARENT EDUCATION

- Parents who have earned a college degree are more likely to transmit the value of higher education to their children in the form of knowledge-based resources such as guidance with SATs and college applications (Fallon, 1997; Hossler et al., 1999; Pratt & Skaggs, 1989; Stanton-Salazar & Dornbusch, 1995; Terenzini et al.).
- 25% FIRST GENERATION students aspired to degrees beyond the bachelor's; however only 2.8% attained those degrees (McCarron, Pagliarulo, Inkelas & Kurotsuchi, 2006)

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First Generation Students: Aspirations versus Attainment of degrees beyond the bachelor's.

“Studies show that parental education plays an important role in baccalaureate and post-baccalaureate expectations. Unfortunately, attainment of such is unremarkable.”

## Intangibles (Attitudes/Behaviors)

- Students who were planning to pursue graduate studies differed from those who did not in a number of ways. (Scepansky and Bjomsen, 2003).
  - Specifically, those interested in graduate education participated more in class discussions and scored higher in conscientiousness and openness to experience.
- While there have been studies based on motivational constructs associated with graduate school success in certain disciplines of study (e.g., Psychology\*), we know of no other studies that strive to predict the successful completion of post-baccalaureate degrees using only measures from the undergraduate student record (GPA, SAT score, demographic information, or surveys).

\*(Nordstrom & Segrist, 2009)

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Tangible data such as GPA, SAT and demographics may very well prove to be viable predictors of successful completion of graduate degrees. In addition, intangibles are introduced to the college freshman that may pique their curiosity and augment their post-baccalaureate aspirations.

## How?

- DATA SOURCES:
  - Data on who goes on to graduate school and who obtains graduate/professional degree from Saint Mary's traditional undergraduates who obtained their bachelors degree from 1999 – 2003 (allows enough time to complete graduate or professional degree)
  - Data from Saint Mary's enrollment files
  - Data from CIRP Freshmen Survey (35% match rate)
- DATA ANALYSES – Multiple Logistic Regressions:
  - Predicting COMPLETION of graduate/professional degree
  - Predicting ENROLLMENT in graduate or professional school
  - Predicting COMPLETION of graduate/professional degree AFTER ENROLLMENT in graduate/professional school

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## Data Elements

- NATIONAL STUDENT CLEARINGHOUSE
  - Obtain Graduate/Professional Degree?
  - Type of Degree Obtained (major/discipline, school available)
- SAINT MARY'S ENROLLMENT FILES
  - Saint Mary's Cumulative GPA
  - School/Discipline (Economics/Business, Science, Liberal Arts)
  - SAT Scores
  - Gender
  - Ethnic Group (Dummy Coded)
- CIRP FRESHMAN SURVEY (TFS) – 35% match – ID #s not required
  - Parent Income
  - Parent Education
  - Aspirations regarding Graduate/Professional Education
  - Various ratings of self, attitudes, prior and future behavior <sup>12</sup>

Note data like Parent Education and Parent Income are were only available via the CIRP survey during these years. In later years these data would be available from either our application for admission or from financial aid data. Though 90% or so of St. Mary's freshmen completed the CIRP survey for the graduating cohorts studied, the match is only about 35% because ID numbers were NOT required on the CIRP TFS survey.

# RESULTS

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This presentation was made at the California Association for Institutional Research Conference on November 19, 2010.

## Post-Graduate Degree for Graduates of Saint Mary's Traditional Undergraduate Programs

Bachelors Degree Graduates					Obtain ANY Degree after Graduating					
	SCHOOL					SCHOOL				
	Business	Lib. Arts	Science	Total		Business	Lib. Arts	Science	Total	
Year Graduate from St. Mary's	Missing	23	67	14	104	Missing	3	20	9	32
	1999	170	220	76	466	1999	24	64	39	127
	2000	148	223	97	468	2000	21	70	49	140
	2001	145	290	122	557	2001	18	85	43	146
	2002	155	284	122	561	2002	19	73	44	136
	2003	191	266	111	568	2003	25	64	31	120
	2004	191	294	116	601	2004	16	53	38	107
	2005	158	304	86	548	2005	10	46	19	75
	2006	198	315	108	621	2006	15	44	14	73
	2007	165	226	115	506	2007	7	18	6	31
	2008	166	246	128	540	2008	5	16	2	23
2009	163	276	134	573	2009	0	0	3	3	
Total	1,873	3,011	1,229	6,113	Total	163	553	297	1,013	
<b>1999 - 2003</b>	<b>809</b>	<b>1,283</b>	<b>528</b>	<b>2,620</b>	<b>1999 - 2003</b>	<b>107</b>	<b>356</b>	<b>206</b>	<b>669</b>	

Need to narrow degrees to 1999 – 2003 time period to allow graduates to complete degrees. Degrees in this table include associate and second bachelors degrees, but do NOT include credentials.

## Graduate/Professional Degrees for Graduates of Saint Mary's Traditional Undergraduate Programs 1999-2003

		SCHOOL			Total
		Business	Lib. Arts	Science	
Degree Type	Masters of Business Admin	54	24	15	93
	Other Masters Degree	34	250	123	407
	Law Doctorate	9	47	4	60
	Medical Doctorate	0	0	19	19
	Other Professional Doctorate	0	2	12	14
	Doctor of Philosophy	2	6	12	20
<b>Total</b>		<b>99</b>	<b>329</b>	<b>185</b>	<b>613</b>

**Bachelors Degree Graduates**

**Obtain Masters+ Degree**

**% of Grads Obtain Masters+ Degree**

	SCHOOL							SCHOOL									
	Business	Lib. Arts	Science	Total				Business	Lib. Arts	Science	Total					Business	Lib. Arts
Year Graduate from St. Mary's	1999	170	220	76	466	Year Graduate from St. Mary's	1999	21	57	35	113	Year Graduate from St. Mary's	1999	12%	26%	46%	24%
	2000	148	223	97	468		2000	19	66	45	130		2000	13%	30%	46%	28%
	2001	145	290	122	557		2001	17	81	39	137		2001	12%	28%	32%	25%
	2002	155	284	122	561		2002	19	66	39	124		2002	12%	23%	32%	22%
	2003	191	266	111	568		2003	23	59	27	109		2003	12%	22%	24%	19%
<b>Total</b>	<b>809</b>	<b>1,283</b>	<b>528</b>	<b>2,620</b>	<b>Total</b>	<b>99</b>	<b>329</b>	<b>185</b>	<b>613</b>	<b>Total</b>	<b>12%</b>	<b>26%</b>	<b>35%</b>	<b>23%</b>			

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After eliminating associate and second bachelor's degrees, a total of 56 between 1999 - 2003. Number of Masters degrees and above is 613, not 669 as shown on previous slide. Overall 23% of Saint Mary's traditional undergraduates received Masters+ post-graduate degrees in this five year period, with 35% of School of Science graduates obtaining Masters+ degrees, 26% of School of Liberal Arts, but only 12% of School of Economics and Business graduates.

At Saint Mary's "Schools" are good stand-ins for "disciplines"

**Disciplines of Graduate/Professional Degrees for Graduates  
of Saint Mary's Traditional Undergraduate Programs**

		SCHOOL			Total
		Business	Lib. Arts	Science	
Discipline	Engineering/Computer Sci	0	2	3	5
	Biological Sciences	1	1	8	10
	Physical Sciences/Math	0	1	6	7
	Social Sciences	5	14	20	39
	Arts & Humanities	2	56	4	62
	Education	6	103	45	154
	Law	9	48	5	62
	Health Professions	2	16	57	75
	Business	66	27	17	110
	Other Professional/Technical	4	35	7	46
	Unknown	4	26	13	43
Total	99	329	185	613	

Education and Business are the most popular disciplines for post-graduate degrees from Saint Mary's. Would be different for schools with different populations (e.g. University of California campuses).

NOTE: Disciplines and degrees are not categorized in a standard way in the Clearinghouse data. Degree majors are reviewed manually to categorize them into the disciplines shown on this slide.

# Logistic Regression Models

Populations Studied	NO Grad School (1)	In Grad School NO Degree (2)	Have Grad Degree (3)
ALL Traditional Undergraduates who Graduated between 1999-2003, <b>N=2,366</b>	<u>Logistic Regressions for Populations:</u>  <b>A) 1 vs. 2 + 3:</b> No Grad School vs. Grad School  <b>B) 1 + 2 vs. 3 :</b> No Degree vs. Have Degree  <b>C) 2 vs. 3:</b> Not Complete Degree vs. Complete Degree		
Traditional Undergraduates who Graduated between 1999-2003 –AND- have SAT Scores (Freshman Entrants), <b>N=1,629</b>			
Traditional Undergraduates who Graduated between 1999-2003 –AND- were Freshman Entrants that have CIRP Freshman Survey Results, <b>N=503</b>			

Logistic regression will test three models for three different populations.

Graduates with CIRP survey are reduced to 503 because only about 35% of graduates supplied valid ID numbers on the CIRP survey (ID was not required – in later years a much larger percentage of students submitted ID numbers).

## Differences Between Groups : ALL Graduates 1999-2003

Measure	NO Grad School	In Grad School NO Degree	Have Grad Degree
<b>N=2,366</b>	1,167	587	612
Cumulative Undergraduate GPA (Mean)	3.04	3.12	3.26
School of Economics and Business Graduate (%)	40%	18%	16%
School of Science Graduate (%)	16%	23%	31%
School of Liberal Arts Graduate (%)	44%	59%	53%
Catholic (%)	67%	69%	69%
Female (%)	58%	64%	65%
White (%)	68%	66%	69%
Asian (%)	9%	8%	8%
Black (%)	4%	4%	3%
Latino (%)	13%	18%	13%

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Mean differences show potential patterns that can emerge via logistic regression analysis.

Some findings:

- 1) Cumulative Undergraduate GPA is highest for those having obtained graduate degrees.
- 2) Percentage of Saint Mary's graduates from the School of Economics and Business going on to graduate school is lower (regardless of whether they obtained a degree or not).
- 3) Percentage of Saint Mary's graduates from the School of Science obtaining a graduate degree is higher than the corresponding percentages in the "No Grad School" and "In Grad School – NO Degree Groups".
- 4) Females are a little overrepresented among those going on to graduate school.

NOTE: Percentages of minorities are low in these years, but will be more subject to study in later years as Saint Mary's is now a "minority majority" campus, and almost qualifies as a "Hispanic serving institution".

Logistic Regression Coefficients: ALL Graduates 1999-2003			
Measure (N=2,366)	No Grad School vs. Grad School	No Grad Degree vs. Have Grad Degree	Not Complete Grad School vs. Have Grad Degree
<b>Nagelkerke R-square</b>	<b>0.128</b>	<b>0.103</b>	<b>0.056</b>
Cumulative Undergraduate GPA	0.941****	1.185****	0.894****
School of Economics & Business <sup>1</sup>	-1.065****	-0.702****	0.076
School of Science <sup>1</sup>	0.278***	0.472****	0.438***
Catholic	0.176*	0.204*	0.110
Female	-0.149	-0.163	-0.075
White	0.165	-0.107	-0.343
Asian	0.186	-0.056	-0.338
Black	0.658**	0.162	-0.427
Latino	0.466**	-0.125	-0.617**

\*p < .10, \*\*p < .05, \*\*\*p < .01 \*\*\*\*p < .001 – <sup>1</sup>School of Lib Arts is “reference category”

The logistic regression analyses reveal the variables that are still significantly predict the criteria after parsing out overlapping effects.

Best prediction is for Predicting going on to Graduate School (0.128), followed by No Grad Degree vs. Have Grad Degree (0.102) followed by obtaining a graduate degree for those already enrolled in graduate school (0.056). R-squares are the lowest of any of the analyses with these limited number of measures.

Cumulative Undergraduate GPA is THE most predictive measure in all three of the analyses. School of Economics and Business and School of Science are important in the analyses (relative to the reference School of Liberal Arts). Latinos are less likely to obtain a graduate degree once in graduate school.

NOTE ON Nagelkerke R-square: N. J. D. Nagelkerke, “A Note on a General Definition of the Coefficient of Determination,” *Biometrika* 78, no. 3 (1991): 691; N. J. D. Nagelkerke, “Maximum Likelihood Estimation of Functional Relationships, Pays-Bas,” *Lecture Notes in Statistics* 69 (1992): 110. Nagelkerke R-square is one of several “pseudo R-squares” used to evaluate the goodness of fit of the logistic regression models. It is an attempt to imitate the interpretation of multiple R-square based on the log likelihood of a final model vs. log likelihood for a baseline model. Like R-square in ordinary least squares, it is on a 0–1 scale. Nagelkerke’s R-square has the advantage over some other pseudo R-squares in that the range of possible values can extend to 1.

## Differences Between Groups: 1999-2003 Graduates with SAT Scores (Freshman Entrants)

Measure	NO Grad School	In Grad School NO Degree	Have Grad Degree
<b>N=1,629</b>	777	418	434
Cumulative Undergraduate GPA (Mean)	3.08	3.16	<b>3.31</b>
School of Economics and Business Graduate (%)	<b>40%</b>	<b>18%</b>	<b>18%</b>
School of Science Graduate (%)	16%	<b>23%</b>	<b>26%</b>
School of Liberal Arts Graduate (%)	45%	<b>58%</b>	<b>57%</b>
Catholic (%)	70%	68%	68%
Female (%)	57%	61%	63%
White (%)	68%	66%	<b>72%</b>
Asian (%)	7%	9%	9%
Black (%)	3%	4%	2%
Latino (%)	15%	17%	<b>12%</b>
SAT Math (Mean)	536	538	<b>555</b>
SAT Verbal (Mean)	524	536	<b>545</b>

Mean differences show potential patterns that can emerge via logistic regression analysis.

Some findings:

- 1) Cumulative Undergraduate GPA is highest for those having obtained graduate degrees.
- 2) Percentage of Saint Mary's graduates from the School of Economics and Business going on to graduate school is lower (regardless of whether they obtained a degree or not) than the corresponding "No Grad School" Group.
- 3) Percentage of Saint Mary's graduates from the School of Science going on to graduate school is higher than the corresponding percentage in the "No Grad School" Group.
- 4) Percentage of Saint Mary's graduates from the School of Liberal Arts going on to graduate school is higher than the corresponding percentage in the "No Grad School" Group.
- 5) There is a higher percentage of Whites and a lower percentage of Latinos in the Have Grad Degree group compared with the "No Grad School" and "In Grad School-No Degree" Groups.
- 6) Mean SAT Verbal and especially SAT MATH were highest in the Have Grad Degree Group.

Logistic Regression Coefficients: 1999-2003 Graduates with SAT Scores (Freshman Entrants)			
Measure (N=1,629)	No Grad School vs. Grad School	No Grad Degree vs. Have Grad Degree	Not Complete Grad School vs. Have Grad Degree
<b>Nagelkerke R-square</b>	<b>0.113</b>	<b>0.097</b>	<b>0.065</b>
Cumulative Undergraduate GPA	0.855****	1.203****	0.999****
School of Economics & Business <sup>1</sup>	-1.021****	-0.701****	-0.001
School of Science <sup>1</sup>	0.163	0.162	0.097
Catholic	0.056	0.133	0.110
Female	-0.133	-0.096	0.003
White	0.131	-0.197	-0.418
Asian	0.324	-0.154	-0.611
Black	0.564	-0.117	-0.641
Latino	0.278	-0.383	-0.798**
SAT Math	0.001	0.002**	0.002*
SAT Verbal	0.000	-0.001	-0.002*

\*p < .10, \*\*p < .05, \*\*\*p < .01 \*\*\*\*p < .001 – <sup>1</sup>School of Lib Arts is “reference category”

The logistic regression analyses reveal the variables that are still significantly predict the criteria after parsing out overlapping effects.

Best prediction is for Predicting going on to Graduate School (0.113), followed by No Grad Degree vs. Have Grad Degree (0.097) followed by obtaining a graduate degree for those already enrolled in graduate school (0.065). R-squares are low, but higher than in the previous analyses which excluded SAT Scores.

Cumulative Undergraduate GPA is THE most predictive measure in all three of the analyses. School of Economics and Business BUT NOT the School of Science is important in the analyses (relative to the reference School of Liberal Arts).

Having higher SAT math score appears to be important for obtaining a Graduate Degree. Latinos are less likely to obtain a graduate degree once in graduate school.

**Differences Between Groups:  
 Graduates 1999-2003 who were Freshmen Entrants –AND–  
 Have CIRP Freshman Survey – 1**

Measure	NO Grad School	In Grad School NO Degree	Have Grad Degree
<b>N=503</b>	210	140	153
Cumulative Undergraduate GPA (Mean)	3.14	3.21	<b>3.37</b>
School of Economics and Business Graduate (%)	<b>37%</b>	<b>14%</b>	<b>18%</b>
School of Science Graduate (%)	<b>14%</b>	<b>27%</b>	<b>29%</b>
School of Liberal Arts Graduate (%)	49%	59%	53%
Catholic (%)	65%	66%	<b>73%</b>
Female (%)	57%	61%	65%
White (%)	69%	69%	<b>75%</b>
Asian (%)	7%	8%	7%
Black (%)	3%	4%	1%
Latino (%)	15%	18%	14%
SAT Math (Mean)	553	558	<b>565</b>
SAT Verbal (Mean)	548	558	<sup>22</sup> <b>564</b>

Mean differences show potential patterns that can emerge via logistic regression analysis.

Some findings:

- 1) Cumulative Undergraduate GPA is highest for those having obtained graduate degrees.
- 2) Percentage of Saint Mary’s graduates from the School of Economics and Business going on to graduate school is lower (regardless of whether they obtained a degree or not) than the corresponding “No Grad School” Group.
- 3) Percentage of Saint Mary’s graduates from the School of Science going on to graduate school is higher than the corresponding percentage in the “No Grad School” Group.
- 4) Percentage of Saint Mary’s graduates from the School of Liberal Arts going on to graduate school is higher than the corresponding percentage in the “No Grad School” Group (though less prominent differences than for the other schools).
- 5) There is a higher percentage of Whites and a higher percentage of Catholics in the Have Grad Degree group compared with the “No Grad School” and “In Grad School-No Degree” Groups.
- 6) Mean SAT Verbal and SAT MATH were highest in the Have Grad Degree Group.

Differences Between Groups: Graduates 1999-2003 Who were Freshman Entrants with CIRP Freshman Survey - 2 CIRP FRESHMAN SURVEY (TFS) ITEMS			
Measure	NO Grad School	In Grad School NO Degree	Have Grad Degree
<b>N=503</b>	210	140	153
<b>Parent Income</b> (Category Mean on 25-point scale- 15 = \$60,000-74,999 - INCOME)	15.18	15.33	15.33
<b>Mother's Education</b> (Category Mean on 8-point scale - MOTHEduc)	5.10	5.16	5.57
<b>Highest Acad Degree Planned</b> (%Masters+ - DEGASP)	81%	86%	94%
<b>Goal: Important to become an authority in my field</b> (Mean on 4-point scale – GOAL04)	2.85	2.89	2.70
<b>Self Rating: Cooperativeness</b> (Mean on 5-point scale – RATE06)	4.21	4.12	3.94
<b>Future Act: Chance would Change Career Choice</b> (Mean on 4-point scale - FUTACT04)	2.89	2.59	2.63
<b>Future Act: Chance would Participate in Volunteer or Community Service</b> (Mean-4 pt scale - FUTACT25)	2.98	3.18	3.25

For the CIRP Survey it was not possible to use the broader Scale variables (e.g. Habits of Mind) because of insufficient N available for the population studied. Had to fall back on individual survey items WITH SUFFICIENT N. Reviewed a number of measures before setting on those shown here from different parts of the instrument.

- 1) Mean level of Mother's Education (8-point scale) is highest among those obtaining a Graduate Degree
- 2) 94% of those who obtained a graduate degree indicated when they were entering freshmen that they planned to seek a degree of Masters or better, a higher percentage than in the "In Grad School, No Degree" Group (86%) or in the "No Grad School" Group (81%).
- 3) The importance of becoming an authority in ones field is rated lower in the "Have Grad Degree" Group, a counterintuitive finding.
- 4) The self-rating of "cooperativeness" is lower in the "Have Grad Degree" Group
- 5) Likelihood of changing career is rated lower among those going on to graduate school
- 6) Those going on to graduate school indicate they are more likely to participate in volunteer or community service.

NOTE: Variable names in CAPS are provided from CIRP Freshman Survey (TFS) multi-year data file (in case others want to use them).

**Logistic Regression Coefficients:  
Graduates 1999-2003 who were Freshmen Entrants –AND-  
Have CIRP Freshman Survey - STEP 1: NON-CIRP ITEMS ONLY**

Measure (N=503)	No Grad School vs. Grad School	No Grad Degree vs. Have Grad Degree	Not Complete Grad School vs. Have Grad Degree
<b>Nagelkerke R-square – STEP 1</b>	<b>0.150</b>	<b>0.123</b>	<b>0.090</b>
Cumulative Undergraduate GPA	1.120****	1.554****	1.288****
School of Economics & Business <sup>1</sup>	-0.935****	-0.320	0.434
School of Science <sup>1</sup>	0.712***	0.609**	0.399
Catholic	0.185	0.391*	0.350
Female	-0.094	-0.018	0.095
White	1.037**	0.546	0.079
Asian	1.147*	0.504	-0.171
Black	1.015	-0.545	-1.168
Latino	1.176**	0.424	-0.212
SAT Math	0.001	0.000	0.000
SAT Verbal	0.000	-0.001	-0.001

\*p < .10, \*\*p < .05, \*\*\*p < .01 \*\*\*\*p < .001 – <sup>24</sup>School of Lib Arts is "reference category"

The logistic regression analyses reveal the variables that are still significantly predict the criteria after parsing out overlapping effects.

**IN THE “FIRST STEP” OF THESE ANALYSES WE CONSIDER ONLY THE MEASURES USED IN THE FIRST TWO ANALYSES ON THE POPULATION WHO ALSO HAVE CIRP DATA, BUT WITHOUT THOSE CIRP MEASURES BEING INCLUDED.**

Best prediction is for Predicting going on to Graduate School (0.150), followed by No Grad Degree vs. Have Grad Degree (0.123) followed by obtaining a graduate degree for those already enrolled in graduate school (0.090). R-squares are relatively low, but higher than in the previous analyses on larger populations.

Cumulative Undergraduate GPA is THE most predictive measure in all three of the analyses. School of Economics and Business and the School of Science are important in the analyses (relative to the reference School of Liberal Arts) in predicting going on to graduate school.

Whites, Asians, and Latinos are more likely to go on to graduate school (though not necessarily more likely to finish in this analysis).

**Logistic Regression Coefficients:  
Graduates 1999-2003 who were Freshmen Entrants –AND-  
Have CIRP Freshman Survey – STEP 2: *INCLUDES CIRP ITEMS***

Measure (N=503)	No Grad School vs. Grad School	No Grad Degree vs. Have Grad Degree	Not Complete Grad School vs. Have Grad Degree
<b>Nagelkerke R-square – STEP 2</b>	<b>0.218</b>	<b>0.216</b>	<b>0.184</b>
Cumulative Undergraduate GPA	1.142****	1.634****	1.505****
School of Economics & Business <sup>1</sup>	-0.872****	-0.192	0.610
School of Science <sup>1</sup>	0.608**	0.554**	0.433
Catholic	0.190	0.485**	0.530*
Female	-0.221	-0.125	0.048
White	1.383**	0.890	0.053
Asian	1.514**	1.021	0.103
Black	1.312	-0.508	-1.667
Latino	1.574****	0.894	-0.037
SAT Math	-0.001	-0.001	-0.002
SAT Verbal	0.000	-0.001	-0.002

\*p < .10, \*\*p < .05, \*\*\*p < .01 \*\*\*\*p < .001 – <sup>25</sup>School of Lib Arts is "reference category"

The logistic regression analyses reveal the variables that are still significantly predict the criteria after parsing out overlapping effects.

**IN THE “SECOND STEP” OF THESE ANALYSES WE CONSIDER THE MEASURES USED IN THE FIRST TWO ANALYSES ON THE POPULATION WHO ALSO HAVE CIRP DATA, ALONG WITH THE CIRP MEASURES.**

Best prediction is for Predicting going on to Graduate School (0.218), followed by No Grad Degree vs. Have Grad Degree (0.216) followed by obtaining a graduate degree for those already enrolled in graduate school (0.184). R-squares are the highest of any of the analyses, especially for the prediction of who will complete graduate school.

Cumulative Undergraduate GPA is THE most predictive measure in all three of the analyses. School of Economics and Business and the School of Science are important in the analyses (relative to the reference School of Liberal Arts) in predicting going on to graduate school.

Whites, Asians, and Latinos are more likely to go on to graduate school (though not necessarily more likely to finish in this analysis).

Being Catholic is predictive of going on to graduate school and obtaining a graduate degree.

Logistic Regression Coefficients:  
 Graduates 1999-2003 who were Freshmen Entrants –AND-  
 Have CIRP Freshman Survey – **STEP 2: INCLUDES SELECT CIRP ITEMS**

Measure (N=503)	No Grad School vs. Grad School	No Grad Degree vs. Have Grad Degree	Not Complete Grad School vs. Have Grad Degree
Nagelkerke R-square – STEP 1	0.150	0.123	0.090
<b>Nagelkerke R-square - STEP 2</b>	<b>0.218</b>	<b>0.216</b>	<b>0.184</b>
Parent Income (INCOME)	-0.007	-0.017	-0.008
Mother's Education (MOMEDUC)	0.101	0.184***	0.166**
Highest Academic Degree Planned - % Masters+ (DEGASP)	0.562*	1.210***	1.243***
Importance of becoming an authority in my field (GOAL04)	-0.127	-0.288**	-0.277*
Cooperativeness (RATE06)	-0.344**	-0.510****	-0.509***
Change Career Choice (FUTACT04)	-0.393****	-0.197	0.048
Participate in Volunteer or Community Service (FUTACT25)	0.267**	0.162	0.027

\*p < .10, \*\*p < .05, \*\*\*p < .01 \*\*\*\*p < .001

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HERE ARE THE REMAINING VARIABLES IN THE “SECOND STEP”, THE CIRP MEASURES:

**Note first of all the SIGNIFICANT GAINS BETWEEN THE FIRST STEP (WITHOUT CIRP MEASURES) AND SECOND STEP (WITH CIRP MEASURES):** Predicting going on to Graduate School increases from 0.150 in Step 1 vs. 0.218 in Step 2; No Grad Degree vs. Have Grad Degree increases from 0.123 in Step 1 to 0.216, in Step 2; and most significantly, obtaining a graduate degree for those already enrolled in graduate school **doubles** from 0.090 in Step 1 to 0.184 Step 2. **R-squares are the highest of any of the analyses due to the addition of the CIRP variables.**

A) CIRP VARIABLES PREDICTING GOING ON TO GRADUATE SCHOOL:

- 1) Changing Career Choice (less likely)
- 2) Cooperativeness (less likely)
- 3) Participate in Volunteer or Community Service (more likely)
- 4) Say one plans to get a Masters Degree or higher when an entering freshmen (more likely)

B) CIRP VARIABLES PREDICTING GETTING A GRADUATE DEGREE:

- 1) Cooperativeness (less likely)
- 2) Say one plans to get a Masters Degree or higher when an entering freshmen (more likely)
- 3) Higher Level of Mother's Education (more likely)
- 4) Important to Become an Authority in One's Field (less likely) – counterintuitive

## Summary - 1

- **College GPA** is the best predictor of going on to graduate school and obtaining a graduate or professional degree.
- At Saint Mary's, compared with graduates from the School of Liberal Arts (the "reference " category):
  - graduates from the School of Economics and Business were less likely to go on to graduate school
  - graduates from the School of Science were more likely to obtain their graduate or professional degree

## Summary - 2

- Whites, Asians, and Latinos were more likely to go on to graduate school, though Latinos were less likely to obtain a graduate or professional degree.
- Perhaps related to being in science disciplines, those with higher SAT scores in Math were more likely to complete graduate/professional degrees.

## Summary – 3 (CIRP TFS Items)

In addition to having higher College GPAs

(NOTE: These items ADD significantly to prediction)

- Those going on to graduate school were
  - less likely to rate themselves as “cooperative”
  - less likely to say they would change careers
  - more likely to participate in voluntary or community service.
- Those obtaining a graduate or professional degree were
  - more likely to say they will seek an advanced degree
  - more likely to come from families where there is a higher level of mother’s education
  - less likely to rate themselves as “cooperative”
  - less likely to say is important to become an authority in their field
  - more likely to be Catholic (in 1 analysis only– needs more study)

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## Issues/Next Steps

- Need for INTERNAL and EXTERNAL CROSSVALIDATION.
- In future years, in later graduating classes, can use CIRP scales (e.g. “Habits of Mind”, etc.) instead of single items. Also, at Saint Mary’s , for later classes can use consistent applicant file and financial aid file data that were not available for this study.
- Get a better understanding of the roles attitudes and discipline selection play on for both completing as well as going on to graduate/professional school .
- CLEARINGHOUSE data, SURVEYS (like CIRP) , and internal college file data combinations CAN be employed IN COMBINATION to answer research questions.

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