A Study of the Relationship between ENGL1301 and Student Performance in Intensive Writing Courses

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Executive Summary

This study was conducted to ascertain the relationship between students' performance in ENGL1301 (Composition/Rhetoric I) and their performance in intensive writing courses for the purpose of determining whether or not ENGL1301 should be required as a prerequisite to all courses that involve intensive writing. Data were extracted from Collin's student information system for fiscal years 2003 through 2008 related to course-taking patterns and performance in ENGL1301 and six courses that academic administrators identified as intensive writing courses (GOVT2301, GOVT2302, HIST1301, HIST1302, HUMA1301, and SOCI1301). The data were analyzed using multinomial logistic regression in SPSS.

The study produced three primary findings. (1) Better performance in ENGL1301 decreased the odds that students would experience negative outcomes (withdrawal and grades of D or F) in intensive writing courses. (2) In most instances, students who were not college ready were more likely than other students to experience negative outcomes in intensive writing courses. (3) Taking ENGL1301 before, after, or concurrently with the intensive writing courses was, at best, an inconsistent predictor of student performance in intensive writing courses.

The latter finding, while complicating the interpretation of the analysis, contributed most significantly to answering the question of whether or not ENGL1301 should be required as a prerequisite to other intensive writing courses. If ENGL1301 were germane to performance in intensive writing courses, then taking ENGL1301 before taking the intensive writing courses should consistently reduce the odds of negative outcomes in the subsequent courses. Since the sequencing of ENGL1301 did not consistently predict the likelihood of adverse outcomes in intensive writing courses, and since college readiness and having effective writing skills were both predictors of the likelihood of adverse outcomes in intensive writing courses, the evidence suggests that ENGL1301 should not be required as a prerequisite to intensive writing courses. The data do underscore the importance of ensuring that students are college-ready and have some degree of writing proficiency, whether or not that proficiency comes from ENGL1301, before attempting intensive writing courses.

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Introduction

The purpose of the study was to assess the relationship between student performance in ENGL1301 (Composition/Rhetoric I) and student performance in intensive writing courses to determine whether or not there is sufficient justification for requiring ENGL1301 (freshman composition) as a prerequisite to all courses that include intensive writing experiences as part of the Collin College curriculum. Academic administrators identified six courses that comprised the operational definition of intensive writing courses for purposes of this study: GOVT2301 (American Government I), GOVT2302 (American Government II), HIST1301 (U.S. History I), HIST1302 (U.S. History II), HUMA1301 (Introduction to the Humanities), and PHIL1301 (Introduction to Philosophy).

In designing the study, it was decided that the relationship between ENGL1301 and the intensive writing courses should be controlled for 1) students' college readiness upon first entering Collin (based on initial performance on the Texas Success Initiative [TSI] test) and 2) how ENGL1301 was sequenced relative to the intensive writing courses. In addition, two of the courses (GOVT2302 and HIST1302) are the second in each of two course sequences following GOVT2301 and HIST1301 respectively. Consequently, it was decided that the study should also control for students' performance in the initial course in each sequence since it is reasonable to assume that performance in the first course would have an impact on performance in the second.

Other variables that were initially expected to have potential impact on student performance in intensive writing courses were ethnicity, gender, and age. A preliminary analysis found that these variables had little relationship with performance in intensive writing courses once TSI readiness was taken into account, so, to keep the models as simple as possible, these variables were excluded from the primary analysis that is the subject of this report.

Data for this study were extracted from Collin's student information system (SIS) using a series of Hyperion Explorer (Brio) queries. The data were then analyzed using multinomial logistic regression in SPSS. The decision to use multinomial logistic regression was made because the dependent variable (performance in intensive writing courses) was an ordinal variable that had been recoded as a nominal level variable, and the independent variables were either dichotomous or scaled variables. While multinomial logistic regression is generally considered sufficiently robust to allow ordinal variables to be safely treated as scaled variables, this report makes clear when this was done by highlighting such variables in yellow.

Data were extracted from Collin's student information system (SIS) for all students who had completed any of the intensive writing courses during fiscal years 2003 through 2008. Once those students were identified, their college-wide IDs, course IDs for the intensive writing courses, terms in which the intensive writing courses, and grades received in the intensive writing courses were extracted. Then, data for the remaining variables were extracted: term in which

the initial attempt at ENGL1301 was made (if it had been taken), grade from the initial attempt at ENGL1301, and TSI readiness at initial entry into Collin. Data were manipulated to ensure that there was only one unique record per student, chronological sequencing variables were constructed, data were recoded, and any students who had incomplete data were dropped from the data file.

The final set of variables and their codings used in this study are presented in the following table.

Variable Name	Variable Description	Variable Coding
g2301g3	3-Category GOVT2301 First Attempt Grade	1 = Withdrawn (Grade of W) 2 = NonSuccess (Grade of D or F) 3 = Success (Grade of A, B, or C)
g2302g3	3-Category GOVT2302 First Attempt Grade	
hi1301g3	3-Category HIST1301 First Attempt Grade	
hi1302g3	3-Category HIST1302 First Attempt Grade	
hu1301g3	3-Category HUMA1301 First Attempt Grade	
p1301g3	3-Category PHIL1301 First Attempt Grade	
tsiroe	TSI Readiness on Initial Entry at Collin	0 = Not TSI Ready on Initial Entry 1 = TSI Ready on Initial Entry
e1301g	ENGL1301 First Non-W Grade	0 = F 1 = D 2 = C 3 = B 4 = A
e1301vg2301	ENGL1301 vs. GOVT2301 Chronology	-1 = ENGL1301 taken before given intensive writing course 0 = ENGL1301 taken concurrently with given intensive writing course 1 = ENGL1301 taken after given intensive writing course
e1301vg2302	ENGL1301 vs. GOVT2302 Chronology	
e1301vhi1301	ENGL1301 vs. HIST1301 Chronology	
e1301vhi1302	ENGL1301 vs. HIST1302 Chronology	
e1301vhu1301	ENGL1301 vs. HUMA1301 Chronology	
e1301vp1301	ENGL1301 vs. PHIL1301 Chronology	

It was decided to run six separate models. One model was run with performance in each of the six intensive writing courses as a dependent variable. This was done rather than running a single model for performance in all intensive writing courses to avoid masking any differences that might exist among the six courses.

Literature Review

A review of relevant literature found little empirical research related to the problem addressed in this paper. While there was abundant literature in pedagogical journals on the teaching of freshman composition and its impact on subsequent educational performance, the body of work consisted primarily of opinion pieces, descriptions of specific instructional methods, reviews of the development of writing pedagogy, case studies, anecdotal research, or other qualitative research with limited generalizability rather than quantitative empirical research.

Such a small body of literature leads to two conclusions. First, very little work has been done that addresses the specific purpose and research questions that are the focus of the effort described in this paper. Second, the little research that is available provides no clear direction about the relationship between student performance in freshman composition and their performance in non-English courses with intensive writing components. None of the research uncovered in the review of literature directly addresses the question at hand.

For freshmen students at the University of Colorado at Boulder, Sailor (2008) found that taking a writing course during the freshman year was associated with first year GPA in non-writing courses and retention to the second year. While Sailor's study probably accomplished its intended purpose for the University of Colorado, for at least three reasons, it is not generalizable to the issues at the heart of this project. First, the student population in the College of Arts and Sciences at the University of Colorado is substantially different from the population of students enrolled at community colleges. When Sailor broke out his results by the three writing courses freshman students could take, those who took a more intensive four-credit course designed for students with lower levels of academic preparation (students who may be somewhat more similar to the student spectrum seen in community colleges), the relationship between college writing and retention disappeared, and the relationship between college writing and GPA was diminished. Second, Sailor looked at the association between taking freshman writing and total GPA in non-writing courses rather than performance in specific writing-intensive courses. Thus, subsequent courses may have had no writing content at all. Third, Sailor did not take into account how students performed in freshman writing; only whether or not students had taken the course.

Ahrenhoerster (2006) found evidence that the knowledge and skills acquired by students in composition I and composition II classes, particularly the latter, are applied to writing assignments in subsequent courses in other disciplines. However, his sample was limited to 115 essays collected from 57 students taught by three colleagues in history and communications courses over three semesters. Furthermore, the author offered no explanation of the fact than data in his tables and charts indicated that students who completed only composition I tended to perform worse on essays in subsequent courses than students who completed either the highest level developmental English or who completed that course combined with composition I. He also excluded from his analysis students who had not taken any English at his institution either because they tested out of it or had taken it elsewhere. In excluding students who tested out of composition I, Ahrenhoerster excluded from his study the very students who might have provided insights into the degree to which writing performance on subsequent writing assignments is enhanced by good writing skills without benefit of a freshman composition course.

Plutsky and Wilson (2000) described a study of prerequisites to a business communication course at California State University at Northridge. The business communication course was a writing-intensive lower division course that was required for all business administration and business education majors. The business communication course, in turn, had two prerequisite courses: freshman composition and business computer literacy. Administrators had become concerned because this sequencing of the courses appeared to be slowing students' progress through the program, and they wanted data that would help them determine whether or not the two prerequisite courses were warranted.

In their analysis, the authors examined the relationship between grades in the business communication course and grades in the two prerequisite courses. Plutsky and Wilson concluded that performance in business computer literacy had a significant positive association with subsequent performance in business communication. However, the finding for freshman composition was more equivocal because they found a significant interaction between grades in business communication and instructors in freshman composition. Thus, whether or not freshman composition had a significant relationship with performance in business communication depended more on who taught the freshman composition course than did course content.

Agnew and McLaughlin (1999) conducted a five-year longitudinal study of 61 students who entered their developmental writing courses in 1992. They found that students' performance in basic writing was not a predictor of overall college success. This study was limited in the degree to which it informs this project by the restricted sample and also because it dealt with developmental writing, rather than freshman composition. However, the authors made one important point that is relevant to this project.

> The belief that students must be proficient writers before they can tackle the rest of their college work has long been accepted in the academy and is the foundation around which most colleges and universities build their curricula: hence, the ubiquitous first year basic writing course.
> However, after five years of following our students, we have to question our original assumptions about the role of writing skill as the primary determinant of college success. (p.49)

Findings

Model 1: Relationship between ENGL1301 and GOVT2301

The number of valid cases (highlighted in magenta in Table GOVT2301-1) in relationship to the number of independent variables (3) is 3,043 / 3 = 1,011.3:1. This exceeds the minimum ratio of 10:1 and the preferred ratio of 20:1 indicating that the number of cases is sufficient to meet the sample size requirement for multinomial logistic regression.

Table GOVT2301-1. Case Processing Summary

		N	Marginal Percentage
3-Cat GOVT2301 First Attempt Grade	1 Withdrawn	496	16.3%
	2 NonSuccess	435	14.3%
	3 Success	2112	69.4%
TSI Readiness on Entry	0 Not TSI Ready on Entry	1209	39.7%
	1 TSI Ready on Entry	1834	60.3%
Valid		3043	100.0%
Missing		4603	
Total		7646	
Subpopulation		30	

The proportional by chance classification accuracy rate calculated from marginal rates for the dependent variable (highlighted in gray in Table GOVT2301-1) for "3-Category GOVT2301 First Attempt Grade" was $1.25(.163^2 + .143^2 + .694^2) = 1.25(.027 + .020 + .482) = 1.25 * .529. = .661$. This figure will be used to assess the usefulness of the model following Table GOVT2301-5.

Table GOVT2301-2. Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	644.984			
Final	350.183	294.801	6	.000

Since the final model p-value in the Table GOVT2301-2 (highlighted in cyan) is less than .05, the null hypothesis is rejected that there is no difference between the model without the independent variables and the model that includes the set independent variables (TSI readiness status at initial entry at Collin, sequence of ENGL1301 relative to GOVT2301, and ENGL1301 performance). Thus, this combination of independent variables significantly improves classification of students into categories of GOVT2301 performance (withdrawn [1 = grade of W], unsuccessful completion [2 = grade of D or F], successful completion [3 = grade of A, B, or C]) than chance alone.

Table GOVT2301-3. Likelihood Ratio Tests

Effect	Model Fitting Criteria: -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests: Chi-Square	df	Sig.
Intercept	350.183[a]	.000	0	.
e1301g	622.988	272.804	2	.000
e1301vg2301	359.602	9.419	2	.009
tsiroe	361.002	10.819	2	.004

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The p-values highlighted in cyan in the Table GOVT2301-3, indicate that the associated Chi-square values are sufficiently large, given the degrees of freedom, to allow rejection of the null hypothesis that all the b coefficients associated with each of the three independent variables are equal to zero. Thus, there appears to be a significant relationship between all three independent variables and student performance in GOVG2301.

Variables highlighted in yellow in the tables GOVT2301-3 and GOVT2301-4 are ordinal variables treated as scaled values for purposes of this analysis: e1301g (First Non-W Grade in ENGL1301 [where 0 = F, 1 = D, 2 = C, 3 = B, and 4 = A]) and e1301vg2301 (ENGL1301 vs GOVT2301 Chronology [where -1 = ENGL1301 Taken before GOVT2301, 0 = ENGL1301 Taken Concurrently with GOVT2301, and 1 = ENGL1301 Taken After GOVT2301]).

Table GOVT2301-4. Parameter Estimates

3-Cat GOVT2301 First Attempt Grade[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
1 Withdrawn	Intercept	-.433	.144	9.114	1	.003	
	e1301g	-.419	.045	86.757	1	.000	.657
	e1301vg2301	-.199	.066	9.144	1	.002	.819
	[tsiroe=0]	.300	.102	8.572	1	.003	1.350
	[tsiroe=1]	0[b]	.	.	0	.	.
2 NonSuccess	Intercept	.165	.133	1.539	1	.215	
	e1301g	-.686	.045	233.284	1	.000	.504
	e1301vg2301	-.044	.069	.418	1	.518	.957
	[tsiroe=0]	.238	.112	4.525	1	.033	1.268
	[tsiroe=1]	0[b]	.	.	0	.	.

a. The reference category is: 3 Success.

b. This parameter is set to zero because it is redundant.

Since all the standard error terms in Table GOVT2301-4 for the independent variables (highlighted in green) are less than 2.0, there is no evidence of numerical problems with the data.

In Table GOVT2301-4, the independent variables with significance values less than .05 (highlighted in cyan) have Wald statistics large enough to warrant rejection of the null hypothesis that their associated b coefficients [Exp(B)] equal zero. A significant b coefficient greater than one indicates that, while controlling for the other independent variables in the model, a one-unit change in the given independent variable increases the odds of a subject's placement in the

given category of the dependent variables by b times. A significant b coefficient less than one indicates that a one-unit change in the independent variable decreases the odds of a subject's placement in the given category of the dependent variable by b times.

Table GOVT2301-4, above, suggests that, while controlling for ENGL1301 Chronology Relative to GOVT2301 and Initial TSI Readiness Status, a one unit increase in ENGL1301 performance (say from C to B) decreased the odds by 34% (1 - .657) of a student withdrawing from GOVT2301. A one unit increase in ENGL1301 Chronology Relative to GOVT2301 (going from taking ENGL1301 prior to GOVT2301 [value of -1] to taking the two courses concurrently [value of 0], or going from taking the two courses concurrently [value of 0] to taking ENGL1301 after GOVT2301 [value of 1]) decreased the odds by 18% (1 - .819) of a student withdrawing from GOVT2301. Students not TSI ready when they initially entered Collin (tsiroe = 0) were 35% (1.350 times) more likely to withdraw from GOVT2301 than other students.

Examining Table GOVT2301-4 further suggests that, while controlling for ENGL1301 Chronology Relative to GOVT2301 and Initial TSI Readiness Status, one unit increase in ENGL1301 performance decreased the odds by 50% (1 - .504) of a student not succeeding in GOVT2301 (receiving grades of D or F). Students not TSI ready when they initially entered Collin (tsiroe = 0) were 27% (1.268 times) more likely to earn a grade of D or F in GOVT2301 than were successful students. It is interesting to note that the sequencing of ENGL1301 relative to GOVT2301 was not a significant indicator of whether or not a student earned a grade of D or F in GOVT2301. This is a pattern that will be seen throughout this report and merits discussion at the conclusion.

Table GOVT2301-5. Classification

	Predicted			
Observed	1 Withdrawn	2 NonSuccess	3 Success	Percent Correct
1 Withdrawn	0	62	434	.0%
2 NonSuccess	0	94	341	21.6%
3 Success	0	67	2045	96.8%
Overall Percentage	.0%	7.3%	92.7%	70.3%

The overall model's classification accuracy rate of .703 (highlighted in gray in Table GOVT2301-5) was greater than or equal to the proportional by chance classification accuracy rate of .661, specified following Table GOVT2301-1. Thus, model 1 exceeds the threshold established following table GOVT2301-1 of predicting the classification of students into categories of the dependent variable by at least 25% better than would occur if students were randomly assigned to categories of the dependent variable. This threshold was established by using the coefficient of 1.25 in the calculation of the proportional by chance classification accuracy rate.

Model 2: Relationship between ENGL1301 and GOVT2302

The number of valid cases (highlighted in magenta in Table GOVT2302-1) in relationship to the number of independent variables (4) is 2,133 / 4 = 533.3:1. This exceeds the minimum ratio of 10:1 and the preferred ratio of 20:1 indicating that the number of cases is sufficient to meet the sample size requirement for multinomial logistic regression.

Table GOVT2302-1. Case Processing Summary

		N	Marginal Percentage
3-Cat GOVT2302 First Attempt Grade	1 Withdrawn	283	13.3%
	2 NonSuccess	238	11.2%
	3 Success	1612	75.6%
TSI Readiness on Entry	0 Not TSI Ready on Entry	875	41.0%
	1 TSI Ready on Entry	1258	59.0%
Valid		2133	100.0%
Missing		5513	
Total		7646	
Subpopulation		85[a]	

a. The dependent variable has only one value observed in 21 (24.7%) subpopulations.

The proportional by chance classification accuracy rate calculated from marginal rates for the dependent variable (highlighted in gray in Table GOVT2302-1) for "3-Category GOVT2302 First Attempt Grade" was $1.25(.133^2 + .112^2 + .756^2) = 1.25(.018 + .013 + .572) = 1.25 * .602. = .752$. This figure will be used to assess the usefulness of the model following Table GOVT2302-5.

Table GOVT2302-2. Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	622.902			
Final	484.149	138.752	8	.000

Since the final model p-value in Table GOVT2302-2 (highlighted in cyan) is less than .05, the null hypothesis is rejected that there is no difference between the model without the independent variables and the model that includes the set independent variables (TSI readiness status at initial entry at Collin, sequence of ENGL1301 relative to GOVT2302 performance, ENGL1301 performance, and GOVT2301 performance). Thus, this combination of independent variables significantly improves classification of students into categories of GOVT2302 performance (withdrawn [1 = grade of W], unsuccessful completion [2 = grade of D or F], successful completion [3 = grade of A, B, or C]) than chance alone.

Table GOVT2302-3. Likelihood Ratio Tests

Effect	Model Fitting Criteria: -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests: Chi-Square	df	Sig.
Intercept	484.149[a]	.000	0	.
e1301g	548.158	64.008	2	.000
g2301g3	531.301	47.151	2	.000
e1301vg2302	484.659	.510	2	.775
tsiroe	487.603	3.453	2	.178

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The p-values highlighted in cyan in Table GOVT2302-3 indicate that the associated Chi-square values are sufficiently large, given the degrees of freedom, to allow rejection of the null hypothesis that all the b coefficients associated with Initial Grade in ENGL1301 and Grade from First Attempt at GOVT2301 are equal to zero. Thus, there appears to be a significant relationship between performance in ENGL1301 and performance in GOVT2302 as well between performance in GOVT2301 and performance in GOVT2302. Since the p-values for ENGL1301 Chronology Relative to GOVT2302 and Initial TSI Readiness are greater than .05, there appears to be no significant relationships between when a student takes ENGL1301 relative to when they take GOVT2302 and performance in GOVT2302 and between a student's initial TSI readiness and student performance in GOVT2302.

Variables highlighted in yellow in Table GOVT2302-4 are ordinal variables treated as scaled values for purposes of this analysis: e1301g (First Non-W Grade in ENGL1301 [where 0 = F, 1 = D, 2 = C, 3 = B, and 4 = A]), g2301g3 (Grade in GOVT2301 after First Attempt [where 1 = Withdrawn {grade = W}, 2 = NonSuccessful Completion {grade = D or F}, and 3 = Successful Completion {grade = A, B, or C}]), and e1301vg2302 (ENGL1301 vs GOVT2302 Chronology [where -1 = ENGL1301 Taken before GOVT2302, 0 = ENGL1301 Taken Concurrently with GOVT2302, and 1 = ENGL1301 Taken After GOVT2302]).

Table GOVT2302-4. Parameter Estimates

3-Cat GOVT2302 First Attempt Grade[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
1 Withdrawn	Intercept	.311	.288	1.171	1	.279	
	e1301g	-.287	.063	20.830	1	.000	.750
	g2301g3	-.513	.086	35.512	1	.000	.599
	e1301vg2302	-.066	.093	.499	1	.480	.937
	[tsiroe=0]	.247	.133	3.460	1	.063	1.280
	[tsiroe=1]	0[b]	.	.	0	.	.
2 NonSuccess	Intercept	.658	.296	4.951	1	.026	
	e1301g	-.478	.063	57.024	1	.000	.620
	g2301g3	-.469	.094	24.960	1	.000	.626
	e1301vg2302	-.017	.099	.030	1	.862	.983
	[tsiroe=0]	.060	.145	.171	1	.679	1.062
	[tsiroe=1]	0[b]	.	.	0	.	.

a. The reference category is: 3 Success.

b. This parameter is set to zero because it is redundant.

Since all standard error terms in Table GOVT2302-4 (highlighted in green) for the independent variables are less than 2.0, there is no evidence of numerical problems with the data. The independent variables with significance values less than .05 (highlighted in cyan) have Wald statistics large enough to warrant rejection of the null hypothesis that their associated b coefficients [Exp(B)] equal zero.

Table GOVT2302-4, above, suggests that, while controlling for ENGL1301 Chronology Relative to GOVT2302, GOVT2301 Performance, and Initial TSI Readiness Status, a one unit increase in ENGL1301 performance decreased the odds by 25% (1 - .750) of a student withdrawing from GOVT2302. A one unit increase in GOVT2301 Performance decreased the odds by 40% (1 - .599) of a student withdrawing from GOVT2302. Unlike the model for GOVT2301, TSI readiness on initial entry at Collin and when students took ENGL1301 relative to GOVT2302 were not significant predictors of whether or not students were likely to withdraw from GOVT2302.

Examining Table GOVT2302-4 further suggests that, while controlling for other variables in the model, a one unit increase in ENGL1301 performance decreased the odds of a student not succeeding in GOVT2302 by 38% (1 - .620). A one unit increase in GOVT2301 Performance decreased the odds of a student not succeeding in GOVT2302 by 37% (1 - .626). Neither a student's TSI status upon entering Collin nor when a student took ENGL1301 relative to GOVT2302 were significant predictors of the likelihood to earn grades of D or F in GOVT2302.

Table GOVT2302-5. Classification

	Predicted			
Observed	1 Withdrawn	2 NonSuccess	3 Success	Percent Correct
1 Withdrawn	0	6	277	.0%
2 NonSuccess	0	8	230	3.4%
3 Success	0	10	1602	99.4%
Overall Percentage	.0%	1.1%	98.9%	75.5%

The classification accuracy rate of .755 (highlighted in gray in Table GOVT2302-5) was greater than or equal to the proportional by chance accuracy rate of .752, specified following Table GOVT2302-1. This indicates that the model is at least 25% better than chance at predicting the classification of respondents into categories of the dependent variable.

Model 3: Relationship between ENGL1301 and HIST1301

The number of valid cases (highlighted in magenta in Table HIST1301-1) in relationship to the number of independent variables (3) is 3,072 / 3 = 1,024.0:1. This exceeds the minimum ratio of 10:1 and the preferred ratio of 20:1 indicating that the number of cases is sufficient to meet the sample size requirement for multinomial logistic regression.

Table HIST1301-1. Case Processing Summary

		N	Marginal Percentage
3-Cat HIST1301 First Attempt Grade	1 Withdrawn	473	15.4%
	2 NonSuccess	431	14.0%
	3 Success	2168	70.6%
TSI Readiness on Entry	0 Not TSI Ready on Entry	1158	37.7%
	1 TSI Ready on Entry	1914	62.3%
Valid		3072	100.0%
Missing		4574	
Total		7646	
Subpopulation		30	

The proportional by chance classification accuracy rate calculated from marginal rates for the dependent variable (highlighted in gray in Table HIST1301-1) for "3-Catetory HIST1301 First Attempt Grade" was $1.25(.154^2 + .140^2 + .706^2) = 1.25(.024 + .020 + .498) = 1.25 * .542. = .677$. This figure will be used to assess the usefulness of the model following Table HIST1301-5.

Table HIST1301-2. Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	706.454			
Final	337.119	369.335	6	.000

Since the final model p-value in Table HIST1301-2 (highlighted in cyan, above) is less than .05, the null hypothesis is rejected that there is no difference between the model without the independent variables and the model that includes the set independent variables (TSI readiness status at initial entry at Collin, sequence of ENGL1301 relative to HIST1301 performance, and ENGL1301 performance). Thus, the combination of independent variables significantly improves classification of students into categories of HIST1301 performance (withdrawn [1 = grade of W], unsuccessful completion [2 = grade of D or F], successful completion [3 = grade of A, B, or C]) than chance alone.

Table HIST1301-3. Likelihood Ratio Tests

Effect	Model Fitting Criteria: -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests: Chi-Square	df	Sig.
Intercept	337.119[a]	.000	0	.
e1301g	666.811	329.692	2	.000
e1301vhi1301	360.459	23.340	2	.000
tsiroe	349.137	12.019	2	.002

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The p-values highlighted in cyan in Table HIST1301-3, above, indicate that the associated Chi-square values are sufficiently large, given the degrees of freedom, to allow rejection of the null hypothesis that all the b coefficients associated with each of the three independent variables are equal to zero. Thus, there appears to be a significant relationship between all three independent variables and student performance in HIST1301.

Variables highlighted in yellow in tables HIST1301-3 and HIST1301-4 are ordinal variables treated as scaled values for purposes of this analysis: e1301g (First Non-W Grade in ENGL1301 [where 0 = F, 1 = D, 2 = C, 3 = B, and 4 = A]) and e1301vhi1301 (ENGL1301 vs HIST1301 Chronology [where -1 = ENGL1301 Taken before HIST1301, 0 = ENGL1301 Taken Concurrently with HIST1301, and 1 = ENGL1301 Taken After HIST1301]).

Table HIST1301-4. Parameter Estimates

3-Cat HIST1301 First Attempt Grade[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
1 Withdrawn	Intercept	-.378	.141	7.154	1	.007	
	e1301g	-.470	.045	110.739	1	.000	.625
	e1301vhi1301	-.318	.068	21.989	1	.000	.727
	[tsiroe=0]	.265	.106	6.252	1	.012	1.303
	[tsiroe=1]	0[b]	.	.	0	.	.
2 NonSuccess	Intercept	.198	.131	2.293	1	.130	
	e1301g	-.734	.044	273.360	1	.000	.480
	e1301vhi1301	-.029	.069	.169	1	.681	.972
	[tsiroe=0]	.330	.113	8.512	1	.004	1.392
	[tsiroe=1]	0[b]	.	.	0	.	.

a. The reference category is: 3 Success.

b. This parameter is set to zero because it is redundant.

Since all standard errors of Table HIST1301-4 (highlighted in green, above) for the independent variables are less than 2.0, there is no evidence of numerical problems with the data. The independent variables with significance values less than .05 (highlighted in cyan) have Wald statistics large enough to warrant rejection of the null hypothesis that their associated b coefficients [Exp(B)] equal zero.

Table HIST1301-4, above, suggests that, while controlling for ENGL1301 Chronology Relative to HIST1301 and Initial TSI Readiness Status, a one unit increase in ENGL1301 performance

decreased the odds by 38% (1 - .625) of a student withdrawing from HIST1301. A one unit increase in ENGL1301 Chronology Relative to HIST1301 decreased the odds of a student withdrawing from HIST1301 by 27% (1 - .727). Students not TSI ready when they initially entered Collin were 30% (1.303 times) more likely to withdraw from HIST1301 than other students.

Examining Table HIST1301-4 further suggests that, while controlling for ENGL1301 Chronology Relative to HIST1301 and Initial TSI Readiness Status, one unit increase in ENGL1301 performance decreased the odds by 52% (1 - .480) of a student not succeeding in HIST1301. Students not TSI ready when they initially entered Collin were 39% (1.392 times) more likely to earn a grade of D or F in HIST1301 than successful students. Again, the sequencing of ENGL1301 relative to HIST1301 was not a significant predictor of whether or not a student earned grades of D or F in HIST1301.

Table HIST1301-5. Classification

	Predicted			
Observed	1 Withdrawn	2 NonSuccess	3 Success	Percent Correct
1 Withdrawn	0	60	413	.0%
2 NonSuccess	0	109	322	25.3%
3 Success	0	69	2099	96.8%
Overall Percentage	.0%	7.7%	92.3%	71.9%

The classification accuracy rate of .719 (highlighted in gray in Table HIST1301-5) was greater than or equal to the proportional by chance accuracy rate of .677, specified following Table HIST1301-1, indicating that the model is at least 25% better than chance at predicting the classification of respondents into categories of the dependent variable.

Model 4: Relationship between ENGL1301 and HIST1302

The number of valid cases (highlighted in magenta in Table HIST1302-1) in relationship to the number of independent variables (4) is 2,228 / 4 = 557.0:1. This exceeds the minimum ratio of 10:1 and the preferred ratio of 20:1 indicating that the number of cases is sufficient to meet the sample size requirement for multinomial logistic regression.

Table HIST1302-1. Case Processing Summary

		N	Marginal Percentage
3-Cat HIST1302 First Attempt Grade	1 Withdrawn	263	11.8%
	2 NonSuccess	249	11.2%
	3 Success	1716	77.0%
TSI Readiness on Entry	0 Not TSI Ready on Entry	843	37.8%
	1 TSI Ready on Entry	1385	62.2%
Valid		2228	100.0%
Missing		5418	
Total		7646	
Subpopulation		154[a]	

a. The dependent variable has only one value observed in 46 (29.9%) subpopulations.

The proportional by chance classification accuracy rate calculated from marginal rates for the dependent variable (highlighted in gray in Table HIST1302-1) for "3-Category HIST1302 First Attempt Grade" was $1.25(.118^2 + .112^2 + .770^2) = 1.25(.014 + .013 + .593) = 1.25 * .619. = .774$. This figure will be used to assess the usefulness of the model following Table HIST1302-5.

Table HIST1302-2. Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1106.088			
Final	780.086	326.002	8	.000

Since the final model p-value (highlighted in cyan in Table HIST1302-2) is less than .05, the null hypothesis is rejected that there is no difference between the model without the independent variables and the model that includes this set independent variables (TSI readiness status at initial entry at Collin, sequence of ENGL1301 relative to HIST1302 performance, ENGL1301 performance, and HIST1301 performance). Thus, the combination of independent variables significantly improves classification of students into categories of HIST1302 performance (withdrawn [1 = grade of W], unsuccessful completion [2 = grade of D or F], successful completion [3 = grade of A, B, or C]) than chance alone.

Table HIST1302-3. Likelihood Ratio Tests

Effect	Model Fitting Criteria: -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests: Chi-Square	df	Sig.
Intercept	780.086[a]	.000	0	.
e1301g	865.819	85.733	2	.000
hi1301g	920.942	140.856	2	.000
e1301vhi1302	780.415	.329	2	.848
tsiroe	790.784	10.698	2	.005

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The p-values highlighted in cyan in Table HIST1302-3 indicate that the associated Chi-square values are sufficiently large, given the degrees of freedom, to allow rejection of the null hypothesis that all the b coefficients associated with Initial Non-W Grade in ENGL1301, Grade from Initial Attempt at HIST1301, and Initial TSI Readiness are equal to zero. Thus, there appears to be a significant relationship between performance in ENGL1301 and performance in HIST1302, between performance in HIST1301 and performance in HIST1302, and between initial TSI readiness and performance in HIST1302. Since the p-value for ENGL1301 Chronology Relative to HIST1302 is greater than .05, there appears to be no significant relationship between when a student takes ENGL1301 relative to when they take HIST1302 and student performance in HIST1302.

Variables highlighted in yellow in Table HIST1302-4, below, are ordinal variables treated as scaled values for purposes of this analysis: e1301g (First Non-W Grade in ENGL1301 [where 0 = F, 1 = D, 2 = C, 3 = B, and 4 = A]) and e1301vhi1302 (ENGL1301 vs HIST1302 Chronology [where -1 = ENGL1301 Taken before HIST1302, 0 = ENGL1301 Taken Concurrently with HIST1302, and 1 = ENGL1301 Taken After HIST1302]).

Table HIST1302-4. Parameter Estimates

3-Cat HIST1302 First Attempt Grade[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
1 Withdrawn	Intercept	-.255	.205	1.540	1	.215	
	e1301g	-.286	.064	20.279	1	.000	.751
	hi1301g	-.425	.042	102.683	1	.000	.653
	e1301vhi1302	.044	.087	.257	1	.612	1.045
	[tsiroe=0]	.298	.140	4.507	1	.034	1.347
	[tsiroe=1]	0[b]	.	.	0	.	.
2 NonSuccess	Intercept	.221	.192	1.333	1	.248	
	e1301g	-.555	.061	81.951	1	.000	.574
	hi1301g	-.371	.045	69.269	1	.000	.690
	e1301vhi1302	.034	.090	.141	1	.708	1.034
	[tsiroe=0]	.421	.146	8.329	1	.004	1.523
	[tsiroe=1]	0[b]	.	.	0	.	.

a. The reference category is: 3 Success.

b. This parameter is set to zero because it is redundant.

Since all standard error terms (highlighted in green in Table HIST1302-4) for the independent variables are less than 2.0, there is no evidence of numerical problems with the data. The independent variables with significance values less than .05 (highlighted in cyan) have Wald statistics large enough to warrant rejection of the null hypothesis that their associated b coefficients [Exp(B)] equal zero.

Table HIST1302-4, above, suggests that, while controlling for ENGL1301 Chronology Relative to HIST1302, HIST1301 Performance, and Initial TSI Readiness Status, a one unit increase in ENGL1301 performance decreased the odds by 25% (1 - .751) of a student withdrawing from HIST1302. A one unit increase in HIST1301 Performance decreased the odds by 35% (1 - .653) of a student withdrawing from HIST1302. Students not TSI ready when they initially entered Collin were 35% (1.347 times) more likely to withdraw from HIST1302 than students who were TSI-ready. When students took ENGL1301 relative to HIST1302 was not a significant predictor of whether or not they were likely to withdraw from HIST1302.

Examining Table HIST1302-4 further suggests that, while controlling for other variables in the model, a one unit increase in ENGL1301 performance decreased the odds of a student not succeeding in HIST1302 by 43% (1 - .574). A one unit increase in HIST1301 Performance decreased the odds of a student not succeeding in HIST1302 by 31% (1 - .690). Student who initially entered Collin who were not TSI ready were 52% (1.523 times) more likely to receive grades of D or F in HIST1302 than other students. The sequencing of ENGL1301 relative to HIST1302 was not a significant indicator of the likelihood to earn grades of D or F in HIST1302.

Table HIST1302-5. Classification

	Predicted			
Observed	1 Withdrawn	2 NonSuccess	3 Success	Percent Correct
1 Withdrawn	0	15	248	.0%
2 NonSuccess	0	30	219	12.0%
3 Success	0	20	1696	98.8%
Overall Percentage	.0%	2.9%	97.1%	77.5%

The classification accuracy rate of .775 (highlighted in Gray in Table HIST1302-5) was greater than or equal to the proportional by chance accuracy rate of .774, specified following Table HIST1302-1, indicating that the model is at least 25% better than chance at predicting the classification of respondents into categories of the dependent variable.

Model 5: Relationship between ENGL1301 and HUMA1301

The number of valid cases (highlighted in magenta in Table HUMA1301-1) in relationship to the number of independent variables (3) is 2,296 / 3 = 765.3:1. This exceeds the minimum ratio of 10:1 and the preferred ratio of 20:1 indicating that the number of cases is sufficient to meet the sample size requirement for multinomial logistic regression.

Table HUMA1301-1. Case Processing Summary

		N	Marginal Percentage
3-Cat HUMA1301 First Attempt Grade	1 Withdrawn	346	15.1%
	2 NonSuccess	267	11.6%
	3 Success	1683	73.3%
TSI Readiness on Entry	0 Not TSI Ready on Entry	957	41.7%
	1 TSI Ready on Entry	1339	58.3%
Valid		2296	100.0%
Missing		5350	
Total		7646	
Subpopulation		30	

The proportional by chance classification accuracy rate calculated from marginal rates for the dependent variable (highlighted in gray in Table HUMA1301-1) for "3-Category HUMA1301 First Attempt Grade" was $1.25(.151^2 + .116^2 + .733^2) = 1.25(.023 + .013 + .537) = 1.25 * .574. = .717$. This figure will be used to assess the usefulness of the model following Table HUMA1301-5.

Table HUMA1301-2. Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	562.994			
Final	290.406	272.588	6	.000

Since the final model p-value in Table HUMA1301-2 (highlighted in cyan) is less than .05, the null hypothesis is rejected that there is no difference between the model without the independent variables and the model that includes this set independent variables (TSI readiness status at initial entry at Collin, sequence of ENGL1301 relative to HUMA1301 performance, and ENGL1301 performance). Thus, the combination of independent variables significantly improves classification of students into categories of HUMA1301 performance (withdrawn [1 = grade of W], unsuccessful completion [2 = grade of D or F], successful completion [3 = grade of A, B, or C]) than chance alone.

Table HUMA1301-3. Likelihood Ratio Tests

Effect	Model Fitting Criteria: -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests: Chi-Square	df	Sig.
Intercept	290.406[a]	.000	0	.
e1301g	538.662	248.257	2	.000
e1301vhu1301	303.680	13.275	2	.001
tsiroe	298.203	7.798	2	.020

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The p-values highlighted in cyan in Table HUMA1301-3 indicate that the associated Chi-square values are sufficiently large, given the degrees of freedom, to allow rejection of the null hypothesis that all the b coefficients associated with each of the three independent variables are equal to zero. Thus, there appears to be a significant relationship between all three independent variables and student performance in HUMA1301.

Variables highlighted in yellow in tables HUMA1301-3 and HUMA1301-4 are ordinal variables treated as scaled values for purposes of this analysis: e1301g (First Non-W Grade in ENGL1301 [where 0 = F, 1 = D, 2 = C, 3 = B, and 4 = A]) and e1301vhu1301 (ENGL1301 vs HUMA1301 Chronology [where -1 = ENGL1301 Taken before HUMA1301, 0 = ENGL1301 Taken Concurrently with HUMA1301, and 1 = ENGL1301 Taken After HUMA1301]).

Table HUMA1301-4. Parameter Estimates

3-Cat HUMA1301 First Attempt Grade[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
1 Withdrawn	Intercept	-.723	.172	17.687	1	.000	
	e1301g	-.375	.053	49.905	1	.000	.687
	e1301vhu1301	-.270	.082	11.005	1	.001	.763
	[tsiroe=0]	.230	.121	3.639	1	.056	1.259
	[tsiroe=1]	0[b]	.	.	0	.	.
2 NonSuccess	Intercept	.116	.156	.551	1	.458	
	e1301g	-.815	.055	220.752	1	.000	.443
	e1301vhu1301	.052	.087	.363	1	.547	1.054
	[tsiroe=0]	.337	.142	5.607	1	.018	1.401
	[tsiroe=1]	0[b]	.	.	0	.	.

a. The reference category is: 3 Success.

b. This parameter is set to zero because it is redundant.

Since all standard error terms in Table HUMA1301-4 (highlighted in green, above) for the independent variables are less than 2.0, there is no evidence of numerical problems with the data. The independent variables with significance values less than .05 (highlighted in cyan) have Wald statistics large enough to warrant rejection of the null hypothesis that their associated b coefficients [Exp(B)] equal zero.

Table HUMA1301-4, above, suggests that, while controlling for ENGL1301 Chronology Relative to HUMA1301 and Initial TSI Readiness Status, a one unit increase in ENGL1301 performance decreased the odds by 31% (1 - .687) of a student withdrawing from HUMA1301. A one unit increase in ENGL1301 Chronology Relative to HUMA1301 decreased the odds of a student withdrawing from HUMA1301 by 24% (1 - .763). Students' TSI readiness upon initially entering Collin was not a significant predictor of a student's likelihood to withdraw from HUMA1301.

Examining Table HUMA1301-4 further suggests that, while controlling for ENGL1301 Chronology Relative to HUMA1301 and Initial TSI Readiness Status, one unit increase in ENGL1301 performance decreased the odds by 56% (1 - .443) of a student not succeeding in HUMA1301. Students not TSI ready when they initially entered Collin were 40% (1.401 times) more likely to earn a grade of D or F in HUMA1301 than successful students. The sequencing of ENGL1301 relative to HUMA1301 was not a significant predictor of whether or not a student earned a grade of D or F in HUMA1301.

Table HUMA1301-5. Classification

	Predicted			
Observed	1 Withdrawn	2 NonSuccess	3 Success	Percent Correct
1 Withdrawn	0	38	308	.0%
2 NonSuccess	0	81	186	30.3%
3 Success	0	55	1628	96.7%
Overall Percentage	.0%	7.6%	92.4%	74.4%

The classification accuracy rate of .744 (highlighted in gray in Table HUMA1301-5) was greater than or equal to the proportional by chance accuracy rate of .717, specified following Table HUMA1301-1, indicating that the model is at least 25% better than chance at predicting the classification of respondents into categories of the dependent variable.

Model 6: Relationship between ENGL1301 and PHIL1301

The number of valid cases (highlighted in magenta in Table PHIL1301-1) in relationship to the number of independent variables (3) is 757 / 3 = 252.3:1. This exceeds the minimum ratio of 10:1 and the preferred ratio of 20:1 indicating that the number of cases is sufficient to meet the sample size requirement for multinomial logistic regression.

Table PHIL1301-1. Case Processing Summary

		N	Marginal Percentage
3-Cat PHIL1301 First Attempt Grade	1 Withdrawn	181	23.9%
	2 NonSuccess	126	16.6%
	3 Success	450	59.4%
TSI Readiness on Entry	0 Not TSI Ready on Entry	286	37.8%
	1 TSI Ready on Entry	471	62.2%
Valid		757	100.0%
Missing		6889	
Total		7646	
Subpopulation		30[a]	

a. The dependent variable has only one value observed in 2 (6.7%) subpopulations.

The proportional by chance classification accuracy rate calculated from marginal rates for the dependent variable (highlighted in gray in Table PHIL1301-1) for "3-Category PHIL1301 First Attempt Grade" was $1.25(.239^2 + .166^2 + .594^2) = 1.25(.057 + .028 + .353) = 1.25 * .438. = .547$. This figure will be used to assess the usefulness of the model following Table PHIL1301-5.

Table PHIL1301-2. Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	316.638			
Final	223.009	93.630	6	.000

Since the final model p-value in Table PHIL1301-2 (highlighted in cyan, above) is less than .05, the null hypothesis is rejected that there is no difference between the model without the independent variables and the model that includes this set independent variables (TSI readiness status at initial entry at Collin, sequence of ENGL1301 relative to PHIL1301 performance, and ENGL1301 performance). Thus, the combination of independent variables significantly improves classification of students into categories of PHIL1301 performance (withdrawn [1 = grade of W], unsuccessful completion [2 = grade of D or F], successful completion [3 = grade of A, B, or C]) than chance alone.

Table PHIL1301-3. Likelihood Ratio Tests

Effect	Model Fitting Criteria: -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests: Chi-Square	df	Sig.
Intercept	223.009[a]	.000	0	.
e1301g	315.250	92.241	2	.000
e1301vp1301	223.312	.303	2	.859
tsiroe	223.709	.700	2	.705

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The p-value highlighted in cyan in Table PHIL1301-3 indicates that the associated Chi-square value is sufficiently large, given the degrees of freedom, to allow rejection of the null hypothesis that all the b coefficients associated with initial grade in ENGL1301 are equal to zero. Thus, there appears to be a significant relationship between performance in ENGL1301 and performance in PHIL1301. Since the p-values associated with Initial TSI Readiness and ENGL1301 Chronology Relative to PHIL1301 are greater than .05, there appears to be no significant relationship between these two independent variables and student performance in PHIL1301.

Variables highlighted in yellow in tables PHIL1301-3 and PHIL1301-4 are ordinal variables treated as scaled values for purposes of this analysis: e1301g (First Non-W Grade in ENGL1301 [where 0 = F, 1 = D, 2 = C, 3 = B, and 4 = A]) and e1301vp1301 (ENGL1301 vs PHIL1301 Chronology [where -1 = ENGL1301 Taken before PHIL1301, 0 = ENGL1301 Taken Concurrently with PHIL1301, and 1 = ENGL1301 Taken After PHIL301]).

Table PHIL1301-4. Parameter Estimates

3-Cat PHIL1301 First Attempt Grade[a]		B	Std. Error	Wald	df	Sig.	Exp(B)
1 Withdrawn	Intercept	.512	.250	4.190	1	.041	
	e1301g	-.527	.078	45.482	1	.000	.590
	e1301vp1301	-.012	.112	.011	1	.916	.988
	[tsiroe=0]	.156	.187	.699	1	.403	1.169
	[tsiroe=1]	0[b]	.	.	0	.	.
2 NonSuccess	Intercept	.572	.262	4.757	1	.029	
	e1301g	-.708	.086	68.493	1	.000	.492
	e1301vp1301	-.072	.133	.296	1	.586	.930
	[tsiroe=0]	.070	.219	.103	1	.749	1.073
	[tsiroe=1]	0[b]	.	.	0	.	.

a. The reference category is: 3 Success.

b. This parameter is set to zero because it is redundant.

Since all standard error terms in Table PHIL1301-4 (highlighted in green) for the independent variables are less than 2.0, there is no evidence of numerical problems with the data. The independent variables with significance values less than .05 (highlighted in cyan) have Wald statistics large enough to warrant rejection of the null hypothesis that their associated b coefficients [Exp(B)] equal zero.

Table PHIL1301-4, above, suggests that, while controlling for ENGL1301 Chronology Relative to PHIL1301 and Initial TSI Readiness Status, a one unit increase in ENGL1301 performance decreased the odds by 41% (1 - .590) of a student withdrawing from PHIL1301. Neither the sequencing of ENGL1301 relative to PHIL1301 nor a student's TSI readiness upon initially entering Collin were significant predictors of a student's likelihood to withdraw from PHIL1301.

Examining Table PHIL1301-4 further suggests that, while controlling for ENGL1301 Chronology Relative to PHIL1301 and Initial TSI Readiness Status, a one unit increase in ENGL1301 performance decreased the odds by 51% (1 - .492) of a student not succeeding in PHIL1301. Neither the sequencing of ENGL1301 relative to PHIL1301 nor a student's TSI readiness upon initially entering Collin were significant indicators of whether or not a student earned a grade of D or F in PHIL1301.

Table PHIL1301-5. Classification

	Predicted			
Observed	1 Withdrawn	2 NonSuccess	3 Success	Percent Correct
1 Withdrawn	15	18	148	8.3%
2 NonSuccess	13	19	94	15.1%
3 Success	7	13	430	95.6%
Overall Percentage	4.6%	6.6%	88.8%	61.3%

The classification accuracy rate of .613 (highlighted in gray in Table PHIL1301-5) was greater than or equal to the proportional by chance accuracy rate of .547, specified following Table PHIL1301-1, indicating that the model is at least 25% better than chance at predicting the classification of respondents into categories of the dependent variable.

Summary and Discussion

The most consistent finding of this study is that better ENGL1301 performance reduced the likelihood both of withdrawals and of students receiving D and F grades from intensive writing courses. ENGL1301 performance was a significant predictor of student performance in intensive writing courses for all six intensive writing courses examined for this study. However, as will be noted below, that finding comes with a strong caveat.

Though not quite as consistent, the next reasonably consistent finding of this study is that students who were not ready for college-level work when they initially entered Collin had a greater likelihood of withdrawing or receiving D or F grades from intensive writing courses. By way of exception, in the case of GOVT2302, students who were not TSI ready upon initial entry at Collin were no more likely than other students to receive D or F grades; in the case of HUMA1301, they were no more likely than other students to withdraw, and, in the case of PHIL1301, TSI readiness did not predict the likelihood of either withdrawal or receiving grades of D or F. Otherwise, in every case, students who were not TSI ready upon initial entry at Collin had greater odds of negative outcomes in intensive writing courses than did other students.

The third, and most complicating, finding involves the relationship between negative student outcomes in intensive writing courses (withdrawal and grades of D or F) and the sequencing of ENGL1301 relative to the other courses. It was expected that taking ENGL1301 before taking intensive writing courses would have reduced the likelihood of negative outcomes in the intensive writing courses. In fact, the presupposition of a causal link between ENGL1301 performance and intensive writing courses performance depends on such a temporal sequence. However, in only three of the six intensive writing courses (GOVT2301, HIST1301, and HUMA1301) was there a significant relationship between the chronological ordering and the likelihood of withdrawal. In all three instances, the surprising finding was that the likelihood of withdrawal from intensive writing courses decreased the later students took ENGL1301 relative to the intensive writing course. In no instance was there a significant relationship between the likelihood of students receiving of D or F grades in an intensive writing course and when a student took ENGL1301.

This is where the strong caveat, alluded to above, complicates interpretations of the relationship between ENGL1301 performance on performance in intensive writing courses. As indicated above, better performance in ENGL1301 appears to decrease the odds of negative outcomes in intensive writing courses, but either it 1) makes no difference whether one takes ENGL1301 before, after, or concurrently with intensive writing course or 2) taking ENGL1301 later than the intensive writing course decreases the odds of an adverse outcome in the intensive writing course. If it were really ENGL1301 that made the difference, then one should expect the course-taking sequence to make a difference in intensive writing performance. How does one explain this apparent contradiction?

The most parsimonious explanation of this apparent contradiction is that ENGL1301 performance, per se, is not what makes the difference in intensive writing performance. Rather, it appears that having effective writing skills makes the difference. Students who had effective writing skills, whether or not they had taken ENGL1301, not only performed better in ENGL1301, but they were less likely to experience negative outcomes in intensive writing courses.

In the end, there is no evidence from these data to support a requirement that students successfully complete ENGL1301 prior to enrolling in other intensive writing courses. The other important conclusion that can be drawn from this study is that if the College wants to maximize the odds of students succeeding in intensive writing courses there must be a strong emphasis on ensuring that students are college ready when they enroll in college-level coursework and have solid writing skills before they take intensive writing courses, whether or not those writing skills come from ENGL1301, high school, natural ability, or any other source.

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