

Persistence at a Liberal Arts University and Participation in a Study Abroad Program

Denise Y. Young

North Georgia College & State University

Introduction

Retention and persistence of students is an important issue in contemporary American higher education. Tinto (1993) stated that 60% of students entering higher education for the first time in 1993 will leave their first institution and that about 46% will leave higher education without receiving a 2- or 4-year degree. McLaughlin, Brozovsky and McLaughlin (1998) urged institutional researchers and other senior administrators to view student retention as a strategic issue that can have serious long-term effects on the future of their institutions.

Much of the early research on persistence and attrition was descriptive, in which characteristics of students who persisted in higher education were summarized and compared with those who left (Summerskill, 1962). Theory-based studies on student departure have become more common since the 1970s. Tinto (1986) grouped theories of student departure into five categories: psychological, societal, economic, organizational, and interactional. Hossler (1984) viewed Tinto's Theory of Individual Departure (Tinto, 1975), an interactional theory, as one of the most promising in explaining the process of student attrition. Yorke (1999) stated that Tinto had been the greatest influence on retention studies during the past 20 years. In brief, Tinto's theory considers the college experience to be comprised of academic and social systems. Higher degrees of integration into these systems by students lead to greater commitment to the educational institution and to the goal of degree completion. Tinto (1993) suggested that academic integration could be measured by grade point average and the amount of interaction students have with faculty, and that social integration could be measured by peer-group interactions and involvement in extracurricular activities.

Astin (1977, p. 21) defines the construct of involvement as "the time and effort expended by the student in the activities that relate directly to the institution and its programs." He states that attrition can be decreased by increased student involvement, including special academic programs, such as a study abroad program.

Study Abroad Experiences and Academic and Social Integration

Although there are many studies reported in the research literature on study abroad experiences, few mention persistence or attrition. However, several studies have shown that study abroad experiences, through their multiple dimensions (e.g., academic, social, cultural, and personal), contribute to various aspects of both academic and social integration.

After studying American students over a 3-year period (1968–1970) who participated in a junior year study abroad program in Switzerland, Morgan (1975) concluded that a different kind of learning occurs in a study abroad program than on the home campus. At the home campus, the emphasis is on, in descending order, cognitive, affective, and psychomotor learning activities. But during the study abroad experience, this order becomes affective, psychomotor, and cognitive learning. He noted that the changes occurring during study abroad are related to values, attitudes, goals, and personal philosophy. Furthermore, the process of social interaction is expanded, emphasizing the role of social integration in study abroad experiences.

Billigmeier and Forman (1975) reported responses to a 1972 follow-up questionnaire from 39 of 60 students who participated in the University of California's Education Abroad Program in Göttingen during their junior year in 1965–66. All 39 respondents returned to the University of California and completed their bachelor's degrees there after the study abroad experience in Europe. All but 7 of the 39 pursued some form of graduate education. The most frequently cited intellectual advantages of their study abroad experiences were new perspectives and greater understanding of the intellectual and cultural life of the host country, cultivation of interests in the arts and humanities, and interaction with students and teachers on a personal level that provided new dimensions of understanding and interests in specific fields. All of these items are aspects of academic and/or social integration. The main area of personal maturation was that of growth in independence, self-reliance, and the ability to make decisions independently. Personal growth could influence goal and institutional commitment, thereby impacting persistence.

Carsello and Creaser (1976) reported results from a self-evaluation instrument of 209 students (72% in their junior year) that showed study abroad experiences contributed to various aspects of academic and social integration. Students studying in Europe reported changes in interests, attitudes, and skills in 30 areas relating academic and personal aspects of their lives. Topping the list were interests in travel (89%) arts (82%), foreign language (77%), and

history (75%). Also, 64% reported positive change in self-concept, 47% in relating to fellow students, 42% in social life, 36% in relating to faculty, 16% in study habits, and 16% in reading assigned texts. In some areas, some students reported a decrease, or a negative change: study habits (42%), reading assigned text (21%), relating to faculty (19%), social life (17%), relating to fellow students (12%), and self-concept (8%).

Most American students participating in study abroad enroll in programs located in a Western European country; however, there have been recent increases in the number of students studying in developing countries. In observing 18 to 27 students per summer since 1992 in Nepal, Wagenaar and Subedi (1996) believe that more social development occurs in students who study in developing countries. They argue that in this setting, students more fully experience "group life" in the form of new friendships, spirit of sharing and helpfulness, and camaraderie. Upon return to their home university, faculty members observed that students who participated in the Nepal program were more involved and enthusiastic in subsequent courses. Again, as shown here, study abroad experiences involved aspects of both academic and social integration.

Among the many goals of study abroad programs are the creation of multi-cultural individuals, fulfillment of a distinctive institutional mission, mastery of a foreign language, knowledge of oneself, learning from others, and improvement in international relations (Goodwin & Nacht, 1988). The University of Dallas Rome Program can be described as fulfilling the distinctive mission of the university's commitment to the "recovery and renewal of the Western heritage of liberal education." The University of Dallas views its Rome program as a foundation for later education (Goodwin & Nacht, 1988). As such, it should not only contribute to intellectual knowledge necessary for future courses, but also it should have a positive association with student retention and persistence.

Purpose of the Study

The purpose of this study was to explore the association between persistence at the University of Dallas, a private liberal arts university, and participation in a study abroad program. Students who participate in the study abroad program at the University of Dallas spend one semester (typically during the sophomore year) at the Rome campus of the university. More than 80% of University of Dallas undergraduates participate in the Rome Program. The Rome Program is located on private, 12-acre campus whose facilities include classrooms, dormitory and cafeteria, housing for faculty, chapel, library, outdoor

amphitheatre, athletic fields and student lounges. Students may spend only one semester in Rome. All students study essentially the same courses in Rome (art and architectural history, literary tradition, western civilization, philosophy, theology, Italian) and live on the same campus with faculty and staff and their families. The Rome Program provides an opportunity for students to more intensely experience the University of Dallas core curriculum, which focuses on the great deeds, ideas, and works of western civilization (*University of Dallas General Bulletin*, 2002). Informal interaction between students and faculty are an integral part of the Rome experience.

Research Questions

1. After adjusting for background characteristics, academic integration, and social integration, what was the association between participation in the Rome Program and the number of semesters of persistence at the University of Dallas after the Rome Program experience?
2. What percentage of participants in the Rome Program persisted at the University of Dallas one semester after their participation?
3. What percentage of participants in the Rome Program persisted at the University of Dallas two semesters after their participation?
4. What percentage of participants in the Rome Program graduated from University of Dallas within 4 years of initial entry?

Methodology

This study used a quasi-experimental research design with 1,237 students to investigate the association between persistence at a liberal arts university and participation in a study abroad program. The theoretical basis for the study was Tinto's Theory of Individual Departure.

Data for this study were extracted from the administrative computing system at the University of Dallas. The following student-level data were used: (a) year of entry to the University of Dallas, (b) gender, (c) ethnicity, (d) religion, (e) whether or not a Texas resident, (f) SAT combined score, (g) percentile of high school rank, (h) major at the end of first semester, (i) first-year grade point average (GPA) at the University of Dallas, (j) whether or not a commuter during the first semester of freshman year, (k) undergraduate degree date, and (l) semester of Rome participation.

The independent variable of interest, also known as the treatment, was participation in the study abroad program during the sophomore year. The control group consisted of students who were qualified to participate in the study abroad program, but chose not to do so. The dependent variable was the number of fall and spring semesters enrolled as an undergraduate at the university post-treatment through spring 2003.

The primary method for ascertaining the association between participation in the Rome Program and persistence was the use of sequential regression analysis to measure the increase in R^2 when the dummy variable for treatment was added to a model containing variables known to be associated with persistence and representing adjustment for background characteristics, academic integration, and social integration. Additional insight was gained through interpretation of regression coefficients and structure coefficients.

A component of Tinto's construct of academic integration is academic performance, which was operationalized as first-year GPA. Commuter status served as a measure of Tinto's construct of social integration. According to Tinto (1993), social integration is primarily a function of extracurricular activities and peer group interactions. Pascarella et al. (1981) cited several studies in which commuting students were not as involved in extracurricular activities nor had as much interaction with faculty and students as did residential students. Several demographic and pre-college variables were used to represent what Tinto (1993) described as pre-entry attributes.

Means and Standard Deviations of Variables

Means and standard deviations of variables used in this study are shown in Table 1.

Several of the variables were dichotomously dummy-coded using 0 and 1. In such instances, the mean is the proportion of observations in the category coded 1 (Hardy, 1993). Two of the variables—SAT score and percentile of high school rank—were missing for some students. Because all but 14 of the 1,237 students in the study had an SAT score, these few missing values were of negligible importance. Of greater concern was that 241 students did not have a value for percentile of high school rank because some high schools do not rank their students. Students who had missing values for any of the variables in the full regression model were excluded from the sequential regression analysis. Allison (2002) recommended this method when the data are missing completely at random, as was presumed the case with high school rank. Table 2 contains means and standard deviations for the 988 students included in regression. They are similar to those in Table 1, indicating

Table 1. Means (Standard Deviations) of Variables

Variable	All N=1,237	Treatment Group N=1,007	Control Group N=230
Independent variables			
Female (yes=1, no=0)	.63 (.48)	.66 (.48)	.52 (.50)
Minority (yes=1, no=0)	.26 (.44)	.23 (.42)	.41 (.49)
Catholic (yes=1, no=0)	.76 (.42)	.80 (.40)	.61 (.49)
State resident (yes=1, no=0)	.51 (.50)	.47 (.50)	.68 (.47)
Commuter (yes=1, no=0)	.09 (.29)	.06 (.23)	.23 (.42)
Undeclared major (yes=1, no=0)	.30 (.46)	.30 (.46)	.28 (.45)
SAT score ^a	1,210 (149)	1,218 (146)	1,175 (155)
Percentile of high school rank ^b	82 (17)	82 (16)	82 (18)
First-year grade point average	3.10 (.52)	3.15 (0.51)	2.92 (0.52)
Dependent variable			
Semesters enrolled post- treatment	3.8 (1.4)	4.0 (1.2)	3.0 (1.7)

^aMissing SAT score for 10 students in treatment group and 4 students in control group

^bMissing high school rank for 201 students in treatment group and 40 students in control group

that that the exclusion of 249 students with either missing an SAT score or percentile of high school rank had little effect on the variables of interest, and confirming the assumption that the data were missing completely at random.

Because subjects were not randomly assigned to the treatment and control groups, it was not unexpected to find pre-treatment differences between the two groups for the variables used in the study (Table 2). In a true experimental design, the random assignment of subjects to treatment and control groups should minimize such differences as those noted. However, in a quasi-experimental design such as this study, these differences are expected and dealt with as part of the statistical analysis. The rationale for the sequential regression approach in this study was so that the association between treatment and persistence could be determined after adjusting for differences in demographic and academic characteristics. Differences between the treatment and control groups for the independent variables were not the focus of this study; however, the differences in Table 2 illustrate the importance of adjusting for these variables so that the differences between the two groups on the dependent variable can be attributed to the treatment (participation in the Rome Program) and not to the differences in characteristics of the two groups.

Table 2. Means (Standard Deviations) of Variables Used in Regression

Variable	All N=988	Treatment Group N=798	Control Group N=190	Effect Size ^a
Independent variables				
Female (yes=1, no=0)	.63 (.48)	.66 (.48)	.54 (.50)	0.25
Minority (yes=1, no=0)	.26 (.44)	.23 (.42)	.41 (.49)	-0.39
Catholic (yes=1, no=0)	.75 (.43)	.79 (.41)	.59 (.49)	0.44
State resident (yes=1, no=0)	.54 (.50)	.50 (.50)	.72 (.45)	-0.46
Commuter (yes=1, no=0)	.09 (.28)	.06 (.23)	.23 (.42)	-0.51
Undeclared major (yes=1, no=0)	.29 (.45)	.29 (.45)	.26 (.44)	0.07
SAT score	1,206 (148)	1,213 (147)	1,174 (149)	0.26
Percentile of high school rank	82 (17)	83 (16)	82 (17)	0.06
First-year grade point average	3.09 (0.52)	3.14 (0.52)	2.91 (0.50)	0.44
Dependent variable				
Semesters enrolled post-treatment	3.8 (1.5)	4.0 (1.3)	3.0 (1.8)	0.66

^aEffect sizes for differences between treatment and control groups were computed using Cohen's *d* for continuous variables and Cohen's *h* for dichotomous variables. Magnitude of effect sizes: .2 = small, .5 = medium, .8 = large (Cohen, 1988).

Findings Related to Research

Question 1

Sequential Regression Analysis

Results of the sequential regression analysis are shown in Table 3. The regression model containing only year of entry explained 2.8% of the variation in the number of semesters enrolled post-treatment. Only students entering the University of Dallas as first-time college students in the fall semesters of 1995, 1996, 1997, 1998, 1999, and 2000 were included in this study. Because the dependent variable (number of semesters of enrollment post-treatment) was measured in spring 2003, students in the earlier cohorts had the opportunity to enroll in more semesters than did students in the later cohorts. The association between semester of entry and the dependent variable was measured and adjusted for by including dummy variables for semester of entry in the regression equation. An additional 3.8% of the variation was explained by the nine variables that measured background characteristics, academic integration, and social integration. Participation in the study abroad program explained an additional 4.2% of the variation in number of semesters enrolled post-treatment. That this one variable contributed more to the R² than did all of the other nine variables collectively, underscores its importance

Table 3. Summary of Sequential Regression Analysis for Predicting Number of Semesters of Post-Treatment Enrollment — Independent Continuous Variables Standardized (N=988)

Variable	Regression Coefficient (full model)	SE	P Value	Increase in R ² (sequential models)
Intercept	3.18	0.19	<.01	
1996 cohort*	-0.06	0.15	.70	
1997 cohort*	-0.13	0.16	.39	
1998 cohort*	0.04	0.15	.78	
1999 cohort*	-0.15	0.15	.31	
2000 cohort*	-0.57	0.16	<.01	
				.0279
Female*	-0.09	0.09	.33	
Minority*	-0.17	0.11	.11	
Catholic	0.18	0.11	.10	
Texas resident*	-0.0004	0.09	.99	
Commuter*	0.08	0.17	.65	
Undeclared major	0.18	0.10	.06	
SAT score	-0.02	0.06	.73	
Percentile of high school	-0.01	0.05	.79	
First-year grade point average (standardized)	0.16	0.06	<.01	
				.0378
Treatment: Participation in Rome Program *	0.83	0.12	<.01	
				.0421

*(yes=1, no=0)

Note. R² for full model = .1078; increase in R² from model without treatment = .0421. There were 1,237 students in this study, but 988 were used in the regression analysis because of missing data, which had minimal impact because the data were determined to be missing at random.

Regression Coefficients

If all of the independent variables are measured in the same units on the same scale, unstandardized regression coefficients can be compared and used to determine their relative importance. However, if the independent variables are measured on different scales, as was the case in this study, then standardized regression coefficients should be used to evaluate the relative importance of each independent variable (Fox, 1997; Lewis-Beck, 1980; Schroeder, Sjoquist, & Stephan, 1986). Table 3 contains the results of the sequential regression analysis when the continuous independent variables were standardized, but not the dummy variables, as recommended by Fox (1997). Although it is common

practice to standardize the dependent variable, it is not required because the relative sizes of the standardized regression coefficients are not affected by the units of scale of the dependent variable (Fox, 1997). In order to keep the dependent variable in easily understandable units (number of semesters of enrollment post-treatment), it was not standardized. Of particular interest in Table 3 is the regression coefficient for treatment (.83), which means that, holding all else constant, participation in the Rome Program was associated with an increase of .83 semesters enrolled post-treatment over the control. Treatment, along with first-year GPA and the 2000 cohort year of entry, were the only variables with p values $<.01$. The next highest p value (.06) was for undeclared major. The regression coefficient of -0.57 for the 2000 cohort year of entry was probably a reflection of the fact that this cohort was limited by the date of data collection (spring 2003) to a maximum of three semesters post-treatment.

Structure Coefficients

Structure coefficients are presented in Table 4. Several authors (Burdenski, 2000; Courville & Thompson, 2001; Thompson & Borrello, 1985) have stressed the importance of interpreting structure coefficients along with regression coefficients. Structure coefficients are the correlation coefficients between each independent variable and the predicted dependent variable. When squared, they can be interpreted as the amount of variance in the predicted dependent variable that is accounted for by each independent variable. Courville and Thompson (2001) pointed out that it is erroneous to presume that independent variables with regression coefficients near 0 do not add to the explanatory value of the regression equation. Two correlated independent variables share some explanatory ability, which may be arbitrarily assigned to one of the variables, causing it to have a higher regression coefficient. This assignment of shared variance may result in a low coefficient for the other correlated variable, appearing as though it makes little contribution (Burdenski, 2000). Because structure coefficients are correlation coefficients (the correlation between the predicted dependent variable and each independent variable), their interpretation can be aided by Cohen's (1988) guidelines on effect sizes for a correlation coefficient. He suggested that values of .10, .30, and .50 be considered small, medium, and large effect sizes, respectively, for a correlation coefficient.

Table 4. Structure Coefficients for Predicting Number of Semesters of Post-Treatment Enrollment (N=988)

Variable	Structure Coefficient	(Structure Coefficient) ²
Female (yes=1, no=0)	-.004	.00002
Minority (yes=1, no=0)	-.34	.12
Catholic (yes=1, no=0)	.29	.08
State resident (yes=1, no=0)	-.21	.04
Commuter (yes=1, no=0)	-.18	.03
Undeclared major (yes=1, no=0)	.18	.03
SAT score	.23	.05
Percentile of high school rank	.10	.01
First-year grade point average	.39	.15
Treatment (yes=1, no=0)	.83	.69

The structure coefficients in Table 4 are the correlations between each independent variable (except for year of entry) in Table 3 and the number of semesters of post-treatment enrollment predicted by the regression coefficients in Table 3. Because the data contained six entering freshman cohorts, there were five dummy variables for year of entry. Interpretation of structure coefficients in such situations is not recommended. Using Cohen’s (1988) guidelines, all but three of the structure coefficients in Table 4 were either 0 or in the range of small-to-medium effect size. Structure coefficients for minority (–.34) and first-year GPA (.39) demonstrated a medium-to-large effect for each of these variables. Most importantly, the structure coefficient for treatment was .83, demonstrating a large association between Rome participation and number of semesters of enrollment post-treatment. The importance of Rome participation, as evidenced by the structure coefficient, concurred with the size of the regression coefficient and the p value in Table 3. When the structure coefficients in Table 4 were squared, it can be seen that participation in the Rome Program (treatment) accounted for 69% of the total variance in predicted number of semesters of enrollment post-treatment. The next highest value (15%) was for first-year GPA.

Findings Related to Research Questions 2 and 3

The data in Table 5 show that 96% of the treatment group was enrolled at the University of Dallas one semester after receiving the treatment and that 91% was enrolled two semesters post-treatment. In contrast, 80% and 72% of the control group were enrolled one and two semesters post-treatment, respectively. No hypothesis tests were conducted on the differences between

the treatment and control groups because the data in Table 5 are population, not sample, data. However, the practical significance of the magnitude of the differences between the treatment and control groups were evaluated using Cohen's (1988) effect size *b* for differences between proportions. According to Cohen (1988), values of .20, .50, and .80 should be considered small, medium, and large effect sizes, respectively, for *b*. The differences between the treatment and control groups in the proportion of students enrolled one and two semesters post-treatment were of medium effect size.

Table 5. Means (Standard Deviations) of Percentage of Students Enrolled 1 and 2 Semesters Post-Treatment (N=1,237)

Item	All N=1,237	Treatment Group N=1,007	Control Group N=230	Effect Size ^a
Enrolled 1 semester post-treatment	.93 (.26)	.96 (.20)	.80 (.40)	.53
Enrolled 2 semesters post-treatment	.88 (.33)	.91 (.28)	.72 (.45)	.51

^aEffect sizes for the difference between treatment and control groups were computed using Cohen's *h*. Magnitude of effect sizes: .2 = small, .5 = medium, .8 = large (Cohen, 1988).

Findings Related to Research Question 4

The data in Table 6 show that 79% of the treatment group graduated from the University of Dallas within 4 years of initial entry. In contrast, 51% of the control group graduated within 4 years. No hypothesis tests were conducted on the difference between the treatment and control groups because the data in Table 6 are population, not sample, data. However, the practical significance of the magnitude of the difference between the treatment and control groups was evaluated using Cohen's (1988) effect size *b* for differences between proportions.

Table 6. Means (Standard Deviations) of Percentage of Students Graduating Within 4 Years of Initial Entry (N=797)

Item	All N=797	Treatment Group N=674	Control Group N=123	Effect Size ^a
Graduated within 4 years	.75 (.43)	.79 (.41)	.51 (.50)	.60

^aEffect size for the difference between treatment and control groups was computed using Cohen's *h*. Magnitude of effect sizes: .2 = small, .5 = medium, .8=large (Cohen, 1988)

Discussion

Association between Persistence and Participation in the Rome Program

The R^2 for the regression equation containing the full complement of variables was .1078 (Table 3). Cohen (1988) suggested R^2 values of .0196, .13, and .26 as guidelines for small, medium, and large effect sizes in social science research. Based on these values, the overall model R^2 of .1078 indicated that these variables taken together had a medium effect on number of semesters enrolled post-treatment. The importance of the treatment in explaining the number of semesters enrolled post-treatment was demonstrated not only by the increase of .0421 in R^2 for participation in the Rome Program in the sequential regression, but also by the absolute and relative sizes of the regression coefficient for treatment (Table 3) and the structure coefficient for treatment (Table 4). The regression coefficients (Table 3) would be used if one were interested in predicting the number of semesters of enrollment post-treatment for a particular student. The interpretation of the regression coefficient of .83 for treatment was that, holding all other variables constant, students who participated in the Rome Program persisted on average .83 semesters longer post-treatment at the University of Dallas than those who did not participate in the Rome Program. In addition, treatment was far more important in predicting number of semesters enrolled post-treatment than any other variable, more than 4.5 times as important as the next highest variables (Catholic, undeclared major, minority, and first-year GPA). The analysis of structure coefficients (Table 4) confirmed the pre-eminent importance of treatment. The structure coefficient for treatment was more than twice the size of the next largest structure coefficients (first-year GPA, minority, and Catholic). Together, all of the variables in the regression model explained about 11% of the variance in number of semesters enrolled post-treatment; however, the structure coefficient of .83 for treatment indicated that 69% of the explained variance was due to the solitary contribution of treatment. First-year grade point average and minority status made the next highest solitary contributions at 15% and 12%, respectively.

Strong evidence of a positive association between participation in the Rome Program and the number of semesters enrolled post-treatment was present in all of the statistical measures examined in this study. Why was this single variable so important? Perhaps it was because participation in the Rome Program was associated with both academic and social integration, whereas the other variables in the model were either background measures or contributed only to one aspect of integration. The nature of the Rome Program created an environment

ripe for student interaction with each other and with faculty. It is likely that the living and learning arrangements of the Rome Program created an atmosphere of enhanced interaction with faculty and peer groups that exceeded the interactions experienced by students who did not go to Rome. Thus, participation in the Rome Program was likely associated with both academic and social integration as defined by Tinto (1993), and was of pre-eminent importance in explaining number of semesters enrolled post-treatment.

Statistical, Practical, Clinical, and Economic Significance of Participation in Rome Program

Statistical significance testing has been widely used for decades to determine the probability of obtaining the results (or more extreme results) observed in the sample given that the specified null hypothesis is true for the population (Kirk, 1996). A variety of shortcomings of statistical significance testing have been noted by Cohen (1994), Kirk (1996) and Thompson (2002). Most notable is that statistical significance tests provide no information as to whether or not the results are axiologically important. Kirk (1996) defined practical significance as “concerned with whether the result is useful in the real world” (p. 746) and suggested a number of measures of effect magnitude that could be used to assess practical significance. Thompson (2002) argued that researchers should supplement statistical significance with practical and clinical significance. Clinical significance refers to whether a treatment makes a real difference in the quality of life of the participants. In addition to statistical, practical, and clinical significance, Leech and Onwuegbuzie (2003) proposed the use of economic significance, which they defined as the economic value of the effect of a treatment, when making educational policy decisions. There was strong quantitative evidence for statistical and practical significance for the association between participation in the Rome Program and number of semesters enrolled post-treatment. In addition, there was anecdotal evidence for clinical and economic significance.

Statistical significance was demonstrated by a p value of $<.01$ for treatment (Table 3). Furthermore, the F test for the increase in R^2 (Cohen et al., 2003) from .0657 to .1078 when treatment was added to the model (Tables 3) had a p value $<.01$.

Practical significance can be assessed by evaluating various measures of strength of association, such as r , r^2 , R , and R^2 (Kirk, 1996). Based on Cohen's (1988) guidelines, the R^2 for the overall model (.1078) was a medium effect size and the increase in R^2 of .0421 when treatment was added to the model

represented a small-to-medium effect. Cohen (1988) stated that a medium effect size “is large enough to be visible to the naked eye” and that “in the course of normal experience, one would become aware of an average difference...between...groups” (p. 26). Because structure coefficients are correlation coefficients, they also can be used to evaluate practical significance. Based on Cohen’s (1988) guidelines, the structure coefficient for treatment (.83, Table 4) represented a large effect.

Clinical significance refers to whether a treatment makes a real difference in the quality of life of the participants (Thompson, 2002). Anecdotal data from students who participated in the Rome Program have shown that it greatly enhanced their educational experience (Heyne, 2002; Loufus, 2003). Alumni have fond memories of their semester in Rome. Furthermore, Rome participants graduated at a higher rate than non-participants (Table 6).

Leech and Onwuegbuzie (2003) defined economic significance as the economic value of the effect of a treatment, and advocated its use by policy makers when assessing educational interventions. Cost-effectiveness, cost-benefit, cost-utility, cost-feasibility, and cost-sensitivity were among the measures they proposed for economic significance. The regression coefficient for treatment was .83 (Table 3), indicating that students who participated in the Rome Program were enrolled at the University of Dallas for almost one semester more than non-participants. At tuition and discount rates for 2003-04, an additional semester of enrollment for 200 students per year yields net tuition revenue of \$833,224. For the fiscal year ending May 31, 2003, there was a net loss of \$799,659 for the Rome Program; however, \$356,500 of that loss was debt service for the Rome facilities, which will diminish each year and eventually reach \$0. When the net tuition revenue associated with increased persistence by students who go to Rome is considered, the annual economic benefit of the Rome Program is approximately \$33,565 ($\$833,224 - \$799,659$). The results of this study provide solid evidence for making a business case that the \$800,000 annual loss on the Rome program is overstated and should be viewed differently.

Summary of Findings

The four research questions and their answers follow.

1. After adjusting for background characteristics, academic integration, and social integration, what was the association between participation in the Rome Program and the number of semesters of persistence at the University of Dallas after the Rome Program experience?

Nine variables that measured background characteristics, academic integration, and social integration explained 3.8% of the variation in number of semesters enrolled post-treatment. Participation in the Rome Program explained an additional 4.2%. In all of the statistical measures examined in this study (incremental increase in R^2 , regression coefficients, adjusted β weights, and structure coefficients), there was evidence of an important positive association between participation in the Rome Program and persistence. Based on the regression coefficient in the regression equation, holding all other variables constant, students who participated in the Rome Program persisted on average .83 semesters longer post-treatment at the University of Dallas than those who did not go to Rome.

2. What percentage of participants in the Rome Program persisted at the University of Dallas one semester after their participation?

Of the 1,007 students in this study who went to Rome, 96% were enrolled at the University of Dallas one semester after Rome participation. This compared to 80% for the 230 students in the control group.

3. What percentage of participants in the Rome Program persisted at the University of Dallas two semesters after their participation?

Of the 1,007 students in this study who went to Rome, 91% were enrolled at the University of Dallas two semesters after Rome participation. This compared to 72% for the 230 students in control group.

4. What percentage of participants in the Rome Program graduated from the University of Dallas within 4 years of initial entry?

Of the 674 students in the study who went to Rome and had the opportunity to graduate within 4 years, 79% graduated within 4 years. This compared to 51% for 123 students in the control group.

Conclusions

There was a statistically and practically significant positive association between participation in the Rome Program and persistence at the University of Dallas. The results of various statistical measures and the demonstration of projected additional net tuition revenue indicated a medium-to-large effect size for participation in the Rome Program. It is likely that participation in this

particular study abroad program was associated with both academic and social integration as defined by Tinto (1993) because of the amount of interaction between students and faculty (one of Tinto's measures of academic integration) and between students themselves (one of Tinto's measures of social integration).

References

- Allison, P. D. (2002). *Missing data. Sage university paper series on quantitative applications in the social sciences, 07-136*. Thousand Oaks, CA: Sage Publications.
- Astin, A. W. (1977). *Four critical years: Effects of college on beliefs, attitudes, and knowledge*. San Francisco: Jossey-Bass, Inc., Publishers.
- Billigmeier, R. H., & Forman, D. (1975). Gottingen in retrospect: A longitudinal assessment of the University of California's Education Abroad Program in Gottingen by 1965–66 participants. *International Review of Education, 21*, 217–230.
- Burdenski, T. K. (2000). *The importance of structure coefficients in multiple regression: A review with examples from published literature*. (ERIC Document Reproduction Service No, ED435704).
- Carsello, C., & Creaser, J. (1976). How college students change during study abroad. *College Student Journal, 10*, 276–278.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist, 49*, 997–1003.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Courville, T., & Thompson, B. (2001). Use of structure coefficients in published multiple regression articles: β is not enough. *Educational and Psychological Measurement, 61*, 229–248.
- Fox, J. (1997). *Applied regression analysis, linear models, and related methods*. Thousand Oaks, CA: Sage Publications.
- Goodwin, C., D., & Nacht, M. (1988). *Abroad and beyond: Patterns in American overseas education*. New York: Cambridge University Press.
- Hardy, M. A. (1993). *Regression with dummy variables. Sage university paper series on quantitative applications in the social sciences, 07-093*. Newbury Park, CA: Sage Publications.
- Heyne, P. (2002, November 27). UD alumnus lauds Dean Ambler's charisma. *University News*, pp. 9, 12.

- Hossler, D. (1984). *Enrollment management: An integrated approach*. New York: College Entrance Examination Board.
- Kirk, R. E. (1996). Practical significance: A concept whose time has come. *Educational and Psychological Measurement*, 56, 746–759.
- Leech, N. L., & Onwuegbuzie, A. J. (2003). *A proposed fourth measure of significance: The role of economic significance in educational research*. Paper presented at the American Educational Research Association, Chicago, IL.
- Lewis-Beck, M. S. (1980). *Applied regression: An introduction*. Sage university paper series on quantitative applications in the social sciences, 07-022. Newbury Park, CA: Sage Publications.
- Loufus, K. (2003, March 5). Student defines Rome experience in one word: Priceless. *University News*.
- McLaughlin, G., W., Brozovsky, P. V., & McLaughlin, J. S. (1998). Changing perspectives on student retention: A role for institutional research. *Research in Higher Education*, 39, 1–17.
- Morgan, E., E., Jr. (1975). Study abroad: A process of adaptation and change. *International Review of Education*, 21, 207–215.
- Pascarella, E. T., Duby, P. B., Miller, V. A., & Rasher, S. P. (1981). Preenrollment variables and academic performance as predictors of freshman years persistence, early withdrawal, and stopout behavior in an urban, nonresidential university. *Research in Higher Education*, 15, 329–349.
- Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students*. San Francisco, CA: Jossey-Bass.
- Schroeder, L. D., Sjoquist, D. L., & Stephan, P. E. (1986). *Understanding regression analysis: An introductory guide*. Sage university paper series on quantitative applications in the social sciences, 07-057. Newbury Park, CA: Sage Publications.
- Summerskill, J. (1962). Dropouts from college. In N. Sanford (Ed.), *The American college: A psychological and social interpretation of the higher learning* (pp. 627–657). New York: John Wiley & Sons, Inc.
- Thompson, B. (2002). “Statistical,” “practical,” and “clinical”: How many kinds of significance do counselors need to consider? *Journal of Counseling & Development*, 80, 64–71.
- Thompson, B., & Borrello, G. (1985). The importance of structure coefficients in regression research. *Educational and Psychological Measurement*, 45, 203–209.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45(1), 89–125.

- Tinto, V. (1986). Theories of student departure revisited. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. II, pp. 359–384). New York, NY: Agathon Press.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.
- University of Dallas General Bulletin*. (2002).
- Wagenaar, T. C., & Subedi, J. (1996). Internationalizing the curriculum: Study in Nepal. *Teaching Sociology*, 24, 272–283.
- Yorke, M. (1999). *Leaving early: Undergraduate non-completion in higher education*. Philadelphia, PA: Palmer Press.