Provisional Admission and other Predictors of Attrition in a Graduate Program in Education

Linda M. Crawford[1], Justus J. Randolph[2] and debra leigh walls rosenstein[2]

[1] *Richard W. Riley College of Education and Leadership, Walden University, Minneapolis, MN, USA*
[2] *Tift College of Education, Mercer University, Atlanta, GA, USA*

Abstract: This study was designed to identify predictors of attrition of graduate students in education, with inclusion of a previously unexamined predictor, provisional admission. The pre-admission predictors considered were undergraduate grade point average, Graduate Record Examination scores, Miller Analogies Test scores, and Georgia Assessment for the Certification of Educators scores. The post-admission predictors considered were number of semesters provisionally admitted, semester of entry, graduate grade point average, and number of course failures. Using binary logistic regression for data obtained from institutional records of 439 students in a graduate education program, no statistically significant pre-admission predictors of graduation were found. The number of semesters provisionally admitted, graduate grade point average, and number of course failures were statistically significant post-admission predictors. In terms of policy implications, limiting the number of terms under which a student may remain provisionally admitted and limiting the number of course failures under which a student may be retained in a program may help reduce student attrition.

Keywords: graduate attrition; graduate retention; predictors of graduate attrition; predictors of graduate retention; provisional admission

1. INTRODUCTION

Lovitts and Nelson (2000) found that "forty years of studies suggest the long-term attrition rate nationwide is about 50 percent" (Introduction section, para. 1). They also suggest that the rate might be higher in recent years and, as a result, even deem attrition in graduate programs to be a *hidden crisis.* They argue that the hidden crisis of attrition not only puts a heavy strain on the reputation and financial resources of the program, it also puts a similar strain on the student as well. Their alarm about attrition rates has been reinforced over time with higher education attrition rates of 30 to 50 percent in the United States, scoring at the top of industrialized nations (Schneider, 2010; Symonds, Schwartz, & Ferguson, 2011).

To glean information that could result in lower attrition, we examined the predictors of attrition of students in a graduate program in education. In particular, we focused on a variable that, to our knowledge, has not been previously examined in the literature—provisional admission. Provisional admission may be defined broadly as allowing student enrollment pending completion of certain requirements (Nichols &

Clinedinst, 2013). In this study, we define provisional admission as the admission of a student to a program before all of the standardized tests needed for admission proper have been received by the program.

2. THEORETICAL FRAMEWORK: GOAL COMMITMENT IN ATTRITION DECISIONS

Of the multitude of theories of student attrition from higher education (e.g., Andres & Carpenter, 1997; Bean, 1980; Bean & Metzner, 1985; Ethington, 1990; Fishbein & Ajzen, 1975; McKinney & Novak, 2012; Monroe, 2006; Pascarella & Terenzini, 1980; Spady, 1970; Tinto, 1975, 1982, 1993, 2012), we have chosen to concentrate on the theories that relate to goal commitment—a factor that we believe can help explain the causal relationship between provisional admission and attrition. The goal-related theories that we discuss below were proposed by Tinto (1975, 1982, 1993, 2012), Fishbein and Ajzen (1975), and Ethington (1990).

In 1975, Tinto put forth a seminal theory of student attrition in higher education and has made several revisions since then (1982, 1993, 2012). In his theory, Tinto explains that attrition decisions are based mainly on

E-mail addresses: linda.crawford@waldenu.edu, randolph_jj@mercer.edu, rosenstein_d@mercer.edu

students' commitment to their own goals and their commitment to the institution, see Figure 1. Tinto argues that goal commitment is reflected in grade performance and intellectual development, which in turn affects academic integration, which ultimately affects attrition decisions.
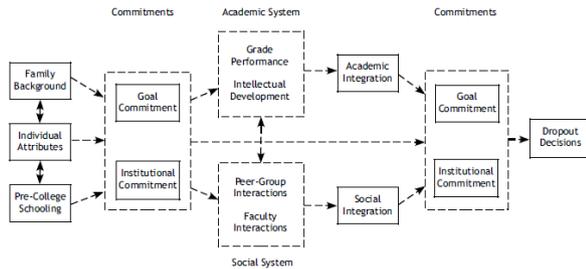

Figure 1. From "Dropout from Higher Education: A Theoretical Synthesis of Recent Research," by V. Tinto, *Review of Educational Research, 45*(1), p. 95. Copyright 1975 by AERA. Reprinted with permission.

Fishbein and Ajzen (1975) contemporaneously suggested a psychological model centered on intention that might help explain students' attrition decisions. Their conceptual framework, explained briefly, is that beliefs influence attitudes, attitudes influence intentions, and intention influences behavior. What is most relevant here is that "intention is viewed as the immediate determinant of behavior" (p. 16). In terms of student retention, they theorized that *intention* to persist is a moderator of attrition decisions.

Ethington (1990) also created a psychological model of student attrition. She theorized that goal orientations, level of degree aspirations, and value placed on a college education predict student attrition. In an empirical investigation of her theory (also in Ethington [1990]), she found that the level of goal orientation had an indirect effect on student persistence; level of aspirations and value had direct effects. She also found that prior educational achievement was the strongest predictor of attrition, with lower prior achievement predictive of attrition and higher prior achievement predictive of retention.

Although the construct has a variety of synonyms (*goal commitment, intention,* or *goal orientation*), the degree to which students resolve to complete their academic goals is a key facet in many theories of student attrition in higher education as discussed above. In this study, we investigated whether the time it takes for a student to formally complete admissions requirements for entrance to a graduate program in education (i.e., the length of time provisionally admitted) could be an indirect indicator of goal commitment, as measured by student attrition.

We hypothesized that the number of semesters that students are provisionally admitted is negatively correlated with goal commitment and, therefore, will be a predictor of attrition. Our rationale is that students who do not have the commitment to submit complete application materials in a timely manner (and therefore are granted provisional admission) are probably also the students who will not have the goal commitment to complete a graduate program of study.

Our own theoretical model is displayed in Figure 2. First, we assume from the previous theoretical and empirical work of Tinto (1975, 1982, 1993, 2012), Fishbein and Ajzen (1975), and Ethington (1990), that goal commitment is related to student attrition. Second, we assume that the length of time students are provisionally admitted is related to their initial goal commitment for many students. Finally, if the first and second assumptions are true, then we theorize that length of time students are provisionally admitted would be related to student attrition. In this study, we investigated that relationship between provisional admission and student attrition. Since there are many more factors related to student attrition than just goal commitment, in the next section we review some of the literature on other predictors of student attrition.
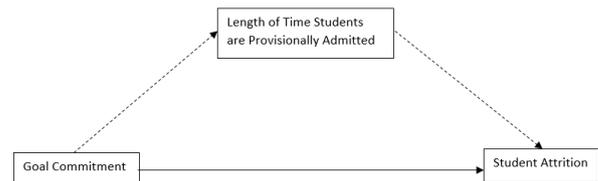

Figure 2. A theory of provisional admission as it relates to goal commitment and student attrition.

3.   RELATED RESEARCH ON PREDICTORS OF ATTRITION IN HIGHER EDUCATION

This review of related literature first presents two large studies that relate to predictors of attrition. The review then summarizes meta-analyses and recent studies that focus on predictors of attrition, and ends with a statement of a gap in research, leading to our study of provisional admission as a predictor of attrition in graduate programs.

In the largest study of its kind, Lovitts (2001) queried 816 completers and noncompleters at the doctoral level. The results support several of the aspects of Tinto's theory. First, Lovitts found that students who shared an office were much more likely to graduate than those who did not. Further, students with full fellowships were less likely to graduate than their peers who were given teaching or research assistantships. These findings support the peer-group interactions element of Tinto's

(1975) theory. Second, Lovitts found that the relationship with the faculty advisor was the most important element in student retention versus student attrition. Much recent research has been done on what constitutes positive advisement (Crawford, Randolph, & Yob, 2014; Hesli & Fink, 2003; Hill, Bahniuk, Dobos, & Rouner, 1989; Tenenbaum, Crosby, & Gliner, 2001; Wrench & Punyanunt, 2004). The consensus is that good mentoring consists of a psychosocial element and a career-related element (Crawford, Randolph, & Yob, 2014; Yob & Crawford, 2012). This research aligns with the *faculty-interactions* element of Tinto's (1975) theory. A third finding from the Lovitts (2001) study was that undergraduate grade point average (GPA) was not a predictor of attrition.

In another large study on the predictors of graduate student attrition, Patterson and McFadden (2009) performed a logistic regression analysis of 640 completers and noncompleters in a Master's of Business Administration (MBA) and a Master's of Communication Sciences and Disorders (MCSD). The predictor variables they used were students' age, ethnicity, gender, undergraduate grade point average (GPA), Graduate Management Admission Test (GMAT) scores, Graduate Record Examination (GRE) scores, and campus (online or traditional). Age and campus were the only statistically significant predictors in both groups; older students and students in online campuses were more likely to be noncompleters. They found that undergraduate GPA was a predictor only for the MCSD students.

The above two studies are important because of their size. Other studies, though, have also examined predictors of attrition in higher education. Two meta-analyses of predictors of college success were discrepant in identifying factors supportive of positive college outcomes. Bair and Haworth (1999), using a qualitative meta-synthesis methodology examining 118 research studies, found that attrition in higher education varied depending on field and program of study as well as the institution, cultural attributes within the department of study, and difficulties with the dissertation process. They also found that academic achievement indicators (excluding standardized test scores), employment, and financial factors were not strong predictors of degree completion. Although they did not study attrition, based on a meta-analysis of 109 studies, Robbins, Lauver, He, et al. (2004) concluded that academic self-efficacy and achievement motivation were the best predictors of academic achievement.

Many other studies have explored the predictors of student success and attrition in higher education. Among those studies, several factors have been found related to student retention in higher education, including:

academic self-efficacy and motivation (Gore, 2006; Guiffrida, Lynch, Wall, & Abel, 2013; Nakajima, Dembo, & Mossler, 2012; Zajacova, Lynch, & Espenshade, 2005), past academic performance (Hardinger, Schauner, Graham, & Garavalia, 2013; Kahn & Nauta, 2001), self-selection of program (Gill & Leigh, 2003; Rask, 2010), faculty interaction (Barnett, 2011; Hart, 2012; Hong, Shull, & Haefner, 2011), enrollment continuity (Crosta, 2014), and peer relationships (Goguen, Hiester, & Nordstrom, 2010; Hart, 2012). However, no prior studies have examined the relationship between provisional admission and attrition of graduate students in education, when taking into account a variety of pre- and post-admission predictors.

4. RESEARCH QUESTIONS

1) What are the best pre-admission predictors of graduation for Master of Arts in Teaching (MAT) students? The pre-admission predictors include undergraduate GPA, GRE, and Miller Analogies Test scores, and scores on the Georgia Assessment for the Certification of Educators (GACE).

2) What are the best post-admission predictors of graduation for MAT students? The post-admission predictors include the number of semesters provisionally admitted, semester of entry (fall, spring, or summer), graduate GPA, and number of course failures.

5. METHODS

A. *Participants and setting*

The data came from the institutional records of all 439 education students who were enrolled in an early childhood, middle grades, or secondary Master of Arts in Teaching (MAT) programs in the 2008-2009 school year. The target entry requirements were for the applicant to have undergraduate grade point average (GPA) of at least 2.5, have a passing score on the Georgia Assessment for the Certification of Educators (GACE), and have either a combined verbal and quantitative Graduate Record Examination (GRE) score of at least 800 or a Miller's Analogy Test score of at least 397. The MAT program was one of many programs within a large teacher education college in the State of Georgia. Table 1 shows the enrollment status of those students at the time of data analysis for this article (spring 2012).

TABLE 1. STATUS OF 2008-2009 MAT STUDENTS

Status	Frequency	Percent	Valid Percent	Cumulative Percent
Dropped out oneself	51	11.6	11.6	11.6
Dismissed	12	2.7	2.7	14.4
Never admitted	60	13.7	13.7	28.0
Active	73	16.6	16.6	44.6
Graduated	243	55.4	55.4	100.0
Total	439	100.0	100.0	

B. Research Design and Data Analysis

In this correlational study, we used binary logistic regression to examine the best set of predictors of attrition for students in a MAT program. We examined both pre-admission and post-admission predictors. The pre-admission predictors included undergraduate GPA, GRE/Miller Analogies Test scores, and scores on the GACE. Since students either had GRE or Miller Analogies Test scores, we standardized those scores and then combined them into one variable (i.e., we created a z score for each participant's GRE or Miller Analogies Test score). The post-admission predictors were the number of semesters provisionally admitted, semester of entry (i.e., fall, spring, or summer), graduate GPA (used as a dichotomous variable—above or equal to 3.54 or below 3.54), and number of course failures. The outcome variable was whether the student graduated from the program or had left the program (i.e., they decided themselves to quit, were never fully admitted, or were dismissed). We excluded from the analysis data from those students who were still active in the two-year program at the time of the analysis (i.e., spring of 2012). The data analysis was conducted with SPSS 20.

6. RESULTS

A. Complications and limitations

Even if students scored higher than 220 on the GACE, the reported GACE score was 220. The exact scores were reported with students with GACE scores less than 220. Because of the excessive restriction in range, eliminated GACE scores as a predictor variable.

Also it is important to note that students with undergraduate GPAs lower than 2.5 or with GRE/Miller Analogies Test scores below a set level were not included in this analysis because they would not be admitted to the program. Therefore, there is a restriction of range in the sample for this variable as well.

B. Pre-admission Predictors

Of those students who had graduated or left the program, there were no statistically significant pre-admission predictors of graduation. See Table 2. GACE scores were not valid predictors because the highest possible reported score was 220 and there was a restriction in range in the GRE/Miller Analogies Test scores, as noted above.

TABLE 2. UNDERGRADUATE GPA AND GRE/MILLER ANALOGIES TEST AS PREDICTORS OF GRADUATION

Variable	B	OR	95% CIs for OR
Constant	1.46		
Undergraduate GPA	0.01	1.01	[0.54, 1.90]
GRE/Miller Analogies Test Scores	-0.01	0.99	[0.71, 1.38]
Nagelkerke R^2	0.00		
$\chi^2(2)$	0.00		

Note. Currently active students were not included in this analysis. $N = 293$. Hosmer-Lemeshow test, $\chi^2(8) = 6.40$, $p = .602$. None of the variables in the model were statistically significant at the .05 alpha level.

C. Post-admission Predictors

The best set of predictors for predicting graduation rate was exit GPA (i.e., the latest recorded GPA for the student), numbers of semesters provisionally admitted, and having one or more course failures. See Table 3 below for the results of a logistic regression analysis. This model accurately predicted attrition in 65.0% of cases and predicted graduation for 86.0% of cases. Currently active students are not included in this analysis. A summary of results is listed below:

1) The odds of a student with a GPA of 3.54 or greater graduating was about 65 times as great as the odds of a student whose GPA was less than 3.54.
2) For each semester a student spent provisionally admitted (up to two or more), the odds of attrition increased threefold.
3) Similarly, the odds of attrition increased fourfold if the student had one or more course failures.

Because logistic regression tables are sometime hard to interpret, we included several tables showing crosstabulations of the number (and percentage) of students in various attrition categories. Table 4 shows the crosstabulation between GPA and attrition. Table 5 shows the crosstabulation between the number of semesters provisionally admitted and attrition. Table 6 shows the crosstabulation between number of course failures and attrition.

TABLE 3. LOGISTIC REGRESSION PARAMETERS PREDICTING GRADUATION FOR 2008-2009 MAT STUDENTS

Variable	B	OR	95% CIs for OR
Constant	-6.23**		
GPA above 3.54	4.18***	65.37	[8.42, 507.58]
Semesters provisionally admitted	-1.08***	0.34	[0.24, 0.48]
One or more course failures	-1.36*	0.26	[0.75, 0.87]
Nagelkerke R^2	0.45		
$\chi 2(3)$	139.59***		

Note. Currently active students were not included in this analysis. $N = 360$. Hosmer-Lemeshow test, $\chi 2(4) = 0.51$, $p = .975$, $*p < .05$, $**p < .01$, $***p < .001$.

TABLE 4. CROSSTABULATION BETWEEN GPA AND ATTRITION FOR 2008-2009 MAT STUDENTS

	Left university or dismissed	Graduated	Total
Low GPA (< 3.54)	41 (98%)	1 (2%)	42 (100%)
High GPA (>= 3.54)	76 (24%)	242 (76%)	318 (100%)
Total	117 (33%)	243 (66%)	360 (100%)

TABLE 5. CROSSTABULATION BETWEEN PROVISIONALITY AND ATTRITION FOR 2008-2009 MAT STUDENTS

	Left university or dismissed	Graduated	Total
Zero semesters provisionally admitted	27 (16%)	147 (84%)	174 (100%)
One semester provisionally admitted	41 (39%)	64 (61%)	105 (100%)
Two or more semesters Provisionally admitted	55 (63%)	32 (37%)	87 (100%)
Total	123 (33%)	243 (66%)	366 (100%)

Note. Currently active students were not included in this analysis.

TABLE 6. CROSSTABULATION BETWEEN COURSE FAILURES AND ATTRITION FOR 2008-2009 MAT STUDENTS

	Left university or dismissed	Graduated	Total
No course failures	93 (28%)	236 (72%)	329 (100%)
One or more course failures	30 (81%)	7 (19%)	37 (100%)
Total	123 (33%)	243 (66%)	366 (100%)

Note. Currently active students were not included in this analysis.

7. DISCUSSION AND CONCLUSION

In terms of the first research question, undergraduate GPA and GRE/Miller Analogies Test scores were not statistically significant pre-admission predictors of graduate student attrition. Note however that students with low undergraduate GPAs or low GRE/Miller Analogies Test scores were not included in this sample because they were not accepted into the program. Therefore, the lack of statistical significance and very small effects of these variables may have been due to the restriction in range.

In terms of the second research question, the number of semesters provisionally admitted, the number of course failures, and graduate GPA were statistically significant post-admission predictors of attrition with large effect sizes. Semester of entry was not a statistically significant predictor.

These results lead to two recommendations for higher education policy makers. One policy recommendation is to limit the number of semesters that students can be provisionally admitted. Although allowing provisional admission may help those few students who cannot get their standardized scores reported to the university in a timely manner, the longer students remain provisionally admitted, the greater the likelihood of their not successfully completing the program. The solution that was adopted at the university where this study was conducted was to limit the number of semesters a student could be provisionally admitted to one. Another policy recommendation is to limit the number of course failures students can have before being dismissed from the program. The likelihood of attrition increases greatly with every course failure.

In terms of recommendations for future research, there is a need to replicate this study to establish the generalizability parameters across units, programs, predictor variables, outcomes, and settings. Of particular interest is whether different variations of provisional admission lead to the same results we found here. Also of interest are the qualitative perceptions of students, faculty, and administrators regarding the relationship between provisional admission and program completion, particularly in terms of the causal mechanisms mediating or moderating the relationship.

In conclusion, although there is no magic combination of admission and retention policies we can recommend, we hope that this information can be used by university administrators to adopt policies that increase the likelihood of success in a graduate course of study and help alleviate the hidden crisis.

REFERENCES

Andres, L., & Carpenter, S. (1997). *Today's higher education students: Issues of admission, retention, transfer, and attrition in relation to changing student demographics.* Eric Document Reproduction Service No. ED 444 638.

Bair, C. R., & Haworth, J. G. (1999, November). *Doctoral student attrition and persistence: A meta-synthesis of research.* Paper presented at the meeting of the Association for the Study of Higher Education, Antonio, TX.

Barnett, E. A. (2011). Validation experiences and persistence among community college students. *The Review of Higher Education, 34*(2), 193-230.

Bean, J. P. (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition. *Research in Higher Education, 12*(2), 155-187.

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*(4), 485-540.

Crawford, L., Randolph, J. J., & Yob, I. (2014). Theoretical development, factorial validity, and reliability of the Online Graduate Mentoring Scale. *Mentoring and Tutoring Partnerships in Learning*, *22*(1), 20-37.

Crosta, P. M. (2014). Intensity and attachment: How the chaotic enrollment patterns of community college students relate to educational outcomes. *Community College Review, 42*(2), 118-142.

Ethington, C. A. (1990). A psychological model for student persistence. *Research in Higher Education, 31*(3), 179-293.

Fishbein, M., & Ajzen, I. (1975) *Belief, attitude, intention and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley.

Gill, A. M. & Leigh, D. E. (2003). Do the returns to community colleges differ between academic and vocational programs? *The Journal of Human Resources, 38*(1), 134-155.

Goguen, L. M. S., Hiester, M. A., & Nordstrom, A. H. (2010). Associations among peer relationships, academic achievement, and persistence in college, *12*(3), 319-337.

Gore, P. A. Jr. (2006). Academic self-efficacy as a predictor of college outcomes: Two incremental validity studies. *Journal of Career Assessment, 14*(1), 92-115.

Guiffrida, D. A., Lynch, M. F., Wall, A. F., & Abel, D. S. (2013). Do reasons for attending college affect academic outcomes? A test of a motivational model from a self-determination theory perspective. *Journal of College Student Development, 54*(2), 121-139.

Hardinger, K. L., Schauner, S., Graham, M., & Garavalia, L. (2013). Admission predictors of academic dismissal for provisional and traditionally admitted students. *Currents in Pharmacy Teaching and Learning, 5,* 33-38.

Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning, 11*(1), 19-42

Hesli, V. L., & Fink, E. C. (2003). Mentoring in a positive graduate student experience: Survey results from the Midwest Region Part 1. *PS: Political Science & Politics, 36*(3), 723-729.

Hill, S. E. K., Bahniuk, M. H., Dobos, J., & Rouner, D. (1989). Mentoring and other communication support in the academic setting. *Group and Organization Studies, 14*, 355-368.

Hong, B.S.S., Schull, P. J., & Haefner, L.A. (2011). Impact of perceptions of faculty on student outcomes of self-efficacy, locus of control, persistence, and commitment. *Journal of College Student Retention: Research, Theory & Practice, 13*(3), 289-309.

Kahn, J. H., & Nauta, M. N. (2001). Social-cognitive predictors of first-year college persistence: The importance of proximal assessment. *Research in Higher Education, 42*(6), 633-652.

Lovitts, B. E. (2001). *Leaving the ivory tower: The causes and consequences of departure from doctoral study*. Lanham, MD: Rowman & Littlefield.

Lovitts, B. E., & Nelson, C. (2000). The hidden crisis in graduate education: Attrition from Ph.D. programs. *Academe Online, 86*(6), 44-50. Retrieved from http://www.aaup.org/AAUP/pubsres/academe/2000/ND/Feat/lovi.htm

McKinney, L., & Novak, H. (2012). The relationship between FAFSA filing and persistence among first-year community college students. *Community College Review, 41*(1), 63-85.

Monroe, A. (2006). Non-traditional transfer student attrition. *The Community College Enterprise, 12*(2), 33-54.

Nakajima, M. A., Dembo, M. H., & Mossler, R. (2012). Student persistence in community colleges. *Community College Journal of Research and Practice, 36*, 591-613.

Nichols, A. H., & Clinedinst, M. (2013). *Provisional admission practices: Blending access and support to facilitate student success.* Washington DC: Pell Institute for the Study of Opportunity in Education.

Pascarella, E. T., & Terenzini, P. T. (1980). Predicting freshman persistence and voluntary dropout decisions from a theoretical model. *Journal of Higher Education, 51*(1), 60-75.

Patterson, B., & McFadden, C. (2009). Attrition in online and campus degree programs. *Online Journal of Distance Learning Administration, 7*(2). Retrieved from http://www.westga.edu/~distance/ojdla/summer122/patterson112.html

Rask, K. (2010). Attrition in STEM fields at a liberal arts college: The importance of grades and pre-collegiate preferences. *Economics of Education Review, 28,* 892-900.

Robbins, S. B., Lauver, K., Le H., Davis, D. Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin, 130*(2), 261-288.

Schneider, M. (2010). *Finishing the first lap: The cost of first-year student attrition in America's four-year colleges and universities.* Washington, DC: American Institutes of Research.

Spady, W. G. (1970). Dropouts from higher education: An interdisciplinary view and synthesis. *Interchange 1*(1), 64-85.

Symonds, W. C., Schwartz, R. B., & Ferguson, R. (2011). *Pathways to prosperity: Meeting the challenge of preparing young Americans for the 21st century.* Cambridge, MA: Harvard Graduate School of Education.

Tennenbaum, H. R., Crosby, F. J., & Gliner, M. D. (2001). Mentoring relationships in graduate school. *Journal of Vocational Behavior, 59*, 326-341.

Tinto, V. (1975). Dropout form higher education: A theoretical synthesis of research. *Review of Educational Research, 45*(1), 89-125.

Tinto, V. (1982). Limits of theory and practice in student attrition. *Journal of Higher Education, 53*(6), 687-700.

Tinto, V. (1993). *Leaving college: rethinking the causes and cures of student attrition.* Chicago, IL: University of Chicago Press.

Tinto, V. (2012). *Completing college: Rethinking institutional action*. Chicago, IL: University of Chicago Press.

Wrench, J. S., & Punyanunt, N. M. (2004). Advisee-advisor communication: An exploratory study examining interpersonal communication variables in the graduate advisee-advisor relationship. *Communication Quarterly, 52*(3), 224-236.

Yob, I., & Crawford, L. (2012). Conceptual framework for mentoring doctoral students. *Higher Learning Research Communications, 2*, 37-50.

Zajacova, A., Lynch, S. M., & Espenshade, T. J. (2005). Self-efficacy, stress, and academic success in college. *Research in Higher Education, 46*(6), 677-706.