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ABSTRACT

This study examined relationships among doctoral candidates' background characteristics, research preparation, research environment, research involvement, student-advisor relationship, research self-efficacy, and dissertation progress. The study focused on differences in research self-efficacy and dissertation progress among students from the three different departments within the college of education at an urban Southern research university. Subjects (n=97) had completed their course work and passed written and oral comprehensive examinations during the years 1987-1997, but had not completed their degrees by December 1997. Subjects responded to a mailed questionnaire that asked questions related to research training, research environment, research involvement, graduate assistantships, relationships with advisors and committee members, research self-efficacy, dissertation status, and demographics. Results indicated that both students' research self-efficacy and their relationships with their advisors and committee members significantly contributed to dissertation progress, and these effects were consistent for all students, regardless of gender, age, degree of financial impediments, or number of years in the doctoral program. None of the student background characteristics were found to have a significant effect on dissertation progress. Also, students' perception of their research training, but not their research environment, was positively related to dissertation progress. (Contains 43 references.) (DB)

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# A Study of Factors Related to Dissertation Progress Among Doctoral candidates:

## Focus on Students' Research Self-efficacy as a Result of Their Research Training and Experiences

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# A Study of Factors Related to Dissertation Progress Among Doctoral candidates: Focus on Students' Research Self-efficacy as a Result of There Research Training and Experiences.

## Introduction

The issue of the low graduation rates and longer time necessary for completion of doctoral degrees has been of great concern to institutions of higher education. According to Bowen and Rudenstine (1992), of all those who entered a doctoral program from 1958 to 1988, only about half actually completed their program. Although attrition from doctoral programs takes place at all stages of the program, it seems that a relatively high percentage of dropouts occurs at the candidacy stage. Having difficulties with dissertations has been identified by administrators of graduate programs as being one of the primary reasons why students leave doctoral study or fail to complete their programs (Robertson, & Sisteler 1971). Many doctoral students reaching the dissertation stage feel a sense of frustration, loneliness, self-doubt, and anxiety that mainly evolves from their inadequate preparation and training in conducting research.

Although the students' research training, confidence, and comfort in doing research are major components of the dissertation stage and an important predictor of a student's success or failure, very few studies have dealt with this issue. Numerous studies have sought to find factors that affect students' successful completion, but most focused on doctoral students at large regardless of which stage of their program they had achieved. According to Tinto (1991) the process of doctoral students' persistence is not uniform in quality across time but rather divided by three stages. The first stage is referred to as a transition and adjustment in which individual students try to integrate into the social and academic community and become members. The second stage is the development of competence and attainment of candidacy that entails the acquisition of knowledge and development of skills required for doctoral research. The third and

final stage is related to completing the dissertation and the actual research project. The students' needs and experiences during each of these stages of the doctoral program differ and play a significant role in students' persistence and completion of the program in later stages (Tinto, 1991).

It has been assumed that once students have completed the course work and successfully passed the comprehensive exams, their courses in statistics and research have prepared them to take upon the task of starting the dissertation process and continuing with their study (Cash & Sanches, 1992). However, many doctoral students reaching this stage feel that their training was inadequate and did not provide the necessary skills to fulfill the task. The testimonial of many of these students indicates a sense of frustration, loneliness, self doubt, anxiety, and uncertainty that might lead to negative attitudes toward the dissertation and eventually their withdrawal from the process (Sternberg, 1991). The dissertation is considered to demonstrate students' capability to do research or contribute to knowledge (Hollis, 1945). Therefore, the degree of their preparation, comfort, and competence presents the most serious threat to the completion of the dissertation if they have not been trained to deal with the intricacies of research. This could be the cause for differential graduation rate and time to degree completion rate between different disciplines. Nerad and Cerny (1993) in their study of students at the University of California at Berkeley found that students in disciplines in which research is conducted as an apprenticeship, where students collaborate with faculty members, completed their degrees in a shorter time than students in disciplines in which research was conducted by individuals alone where there is little or no close contact with faculty members. Also, the higher graduation rate in these disciplines may also be attributed to students' feeling of greater confidence in conducting research as a result of their early involvement with research.

According to Bandura's self-efficacy theory (1977) individuals are more likely to engage in a given behavior or task that they believe they have the ability to complete

successfully. Efficacy expectation evolves from different sources, such as individual's previous experiences with the task, modeling or observing other people's action, or verbal information and emotional reaction such as anxiety and fear. The degree or magnitude of self-efficacy will affect the degree of effort the individual exerts in engaging in a particular task.

Doctoral dissertation research for many students generates certain level of fear and anxiety that is often stem from their inadequate training in research, lack of previous research experiences, and negative attitudes toward research that can lead to students lack of confidence in completing different task of the dissertation. Therefore, it is appropriate to examine students progress at the dissertation stage within the framework of the self-efficacy theory.

The purpose of this study was to examine the relationships among doctoral candidates' background characteristics, research preparation, research environment, research involvement, student-advisor relationships, research self-efficacy, and their dissertation progress. This study focused on students' dissertation progress as a result of their research self-efficacy and research experiences. The additional goal of the study was to examine differences in research self-efficacy and dissertation progress among students from the three different departments within the College of Education, and differences between those students who held graduate assistantship vs. those who did not.

## METHOD

### Participants

The sample consisted of doctoral candidates in the College of Education at an urban Research University in the Mid-South. These students had successfully

completed all their course work and passed their written and oral comprehensive examination during the years 1987 through 1997 without degree completion by December 1997. The subjects ranged in age from 27 to 63 years and were graduate students in 3 departments in the College of Education: Counseling, Educational Psychology and Research, Instruction and Curriculum and Leadership, and Leadership.

This group was selected based on the assumption that its members are at the final stage of the program and had up to ten years to complete the dissertation research. In order to minimize interactions by discipline this study includes only doctoral students who are enrolled in one college of education at one public research university. The list of participants was obtained from the office of the Assistant Dean in the College of Education.

Ninety-seven doctoral candidates responded (28 men, 69 women), yielding a 67% response rate. Respondents completed a mailed survey questionnaire that asked questions related to students' research training, research environment, research involvement, graduate assistantships, students' relationships with their advisors and committee members, research self-efficacy, dissertation status, and demographic information.

**Measure**

The questionnaire items were devised to answer the primary research question for the study, which is: what are the most important predictors of dissertation progress? After an exhaustive review of the related literature, the major issues and variables that were hypothesized to be associated with the research questions were identified, which provided the basis for the questionnaire. In addition, the content and format of several other instruments used in similar studies such as Baird and Smart (1991), Bako-Okolo (1993), Geisler (1995), Phillips (1993), and Royalty et al. (1986) were reviewed and

relevant items were used.

A 61-item questionnaire was constructed to assess three major areas related to this study: (a) students' perception of their research training, experiences, and research involvement, (b) students' relationship with their advisor and committee members, and (c) students' level of confidence in conducting research. Demographic questions, three open-ended questions, and other questions were also included. The three open-ended questions were included in the study to provide additional information and were used as a supplementary data.

The instrument consisted of six sections (see Appendix A). The first section consisted of eight items asking for demographic and personal information. The items in this section asked several questions such as age, gender, ethnicity, marital status, number of children, years in the program, full-time or part-time status, and the extent of financial impediments. The second section asked questions related to the year they passed the comprehensive examination, their major, and the dissertation status. The third section of the questionnaire contained items that asked participants to answer questions related to their perception of research training (environment, preparation, research involvement, holding graduate assistantship, and total number of research and statistics courses). The fourth section contained sixteen items assessing students' perception of their research skills and the impact of their graduate training on the development of these skills.). A revised version of the Self-Efficacy in Research Measure (SERM; Phillips & Russell, 1994) was used to assess students' research self-efficacy. Participants were asked to indicate their level of confidence in successfully performing each task. Level of confidence was measured along a scale from 0 to 9 with 0 indicating no confidence and 9 indicating total confidence. The fifth section of the instrument consisted of fifteen items that asked questions regarding students' degree of agreement with statements related to their relationship with their advisor and committee members. The sixth and final section contained three open-ended items.

## Scales

In order to check the appropriateness of items, the reliability of scales were examined using Cronbach's Alpha. As shown in Table 1 all four scales demonstrated adequate internal consistency reliability. The reliability analysis for each scale was checked to see if the deletion of any item will increase the reliability of the scale by at least .05. The results indicated that all items contributed positively to the reliability of the scales.

(Insert Table I about here)

## Research Design and Data Analysis

The present study was grounded in the Theoretical and empirical work cited earlier. Specifically, the social/psychological models of graduate student attrition/retention as characterized by the approaches of Baird (1993), Girves and Wemmerus (1988), Nerad and Cerny (1993), and Tinto (1993). These models emphasize the process of acquisition and integration of knowledge, and the incorporation/involvement of the student into the academic field. Baird (1990) suggests that a poor academic and social relationship with advisor and inadequate mastery of the academic skills required by the discipline is associated with doctoral student's retention. This study incorporated construct and measures (student background characteristics, research experiences, research environment, and relationship with advisor/committee members) that research grounded in theses approaches has found to be important factors in determining student degree progress. In addition, in determining student's dissertation progress, in order to address the gap in doctoral student's dissertation progress, this study incorporated the construct of research self-efficacy (Gelso, 1993; Landino & Owen, 1988; Phillips & Russell, 1994)

which is found to be the mediating factor between students' research experiences, and subsequent research productivity.

Multiple Regression Analysis

This research study adopted a hierarchical regression strategy to predict dissertation progress as a function of research self-efficacy, research experience and training, students-advisor/committee members relationship, and background variables (years in the program, age, gender, financial impediment). This is a statistical method for studying the relationship between one dependent variable and two or more independent variables (or groups of variables). The multiple regression provides an index ($R^2$) that indicates the proportion of variance in the dependent variable that can be predicted from the set of independent variables. This minimizes the errors of prediction (Shavelson, 1988). The analyses were conducted using the means, standard deviations, and correlations given in Table 2.

(Insert Table 2 about here)

A forced entry method was used to control and specify the order of entry of the variables. Utilizing this method allows investigation of how to students' research experiences, research environment, research involvement, and research preparation, was entered into the equation to determine if they accounted for a significant percentage of unexplained variance beyond that explained by the background variables. Next, the relationship with advisor and committee members scale was entered as a single variable. Finally, the students' self-efficacy in research scale that is hypothesized as being the most important predictor of dissertation progress was entered into the equation to determine if it accounted for a significant proportion of variance beyond that was explained by students' background characteristics, students' research preparation, involvement, environment, and advisor and advisee relationship.

At each of the steps of analysis, the relative importance of the sets of independent variables was determined by testing if the $R^2$ change resulted in a significant increment in the proportion of variance explained in the dependent variable. In the final equation, the significance of the regression coefficients was examined to determine which variables exerted influence on the dependent variable. Standardized regression coefficients were examined to determine which of the significant variables exerted the greatest influence on the dependent variable.

Prior to the regression analysis a test for conditional effects (interactive effects) was conducted to test for the possibility of interaction between gender and the other independent variables. This was done to determine if as past research has suggested (Benkin, 1984; Hobbish, 1978; Mooney, 1968; Tucker et al., 1964; Williams et al., 1970), there were gender differences in factors that influenced doctoral students' degree achievement. To test for the interaction effects, the students' dissertation progress variable was regressed on all independent variables in the model. Next, a set of nine interaction terms that were the cross products of gender and each independent variable were added to the equation. The test on the increase in the $R^2$ change would indicate whether interactive effects were present. If the $R^2$ change is significant, the regression model should be estimated separately for male and female.

In addition two multivariate analysis of variance (MANOVA) were conducted to test the secondary research questions. These questions related to the differences among students in different departments and the differences between those students who held graduate assistantships and those who did not have graduate assistantships on the two variables representing students' research self-efficacy and their dissertation progress. An alpha-level of .05 was used for all tests given the small sample size.

## RESULTS

The results of preliminary analyses conducted indicate that multiculliniarity (a high degree of interrelation among the independent variables) was not a problem in the

specification of this model. According to Pedhazur (1982) the higher the interrelation among the independent variables, the greater the distortion in the estimation of the regression coefficients. The examination of the multicollinearity diagnostics indicate that they were within an acceptable range to rule out the presence of multicollinearity among the variables (all VIF's < 2.6).

The results of the test of the interactive effects showed that the increase in the $R^2$ change was not significant. This indicated that the effects of the independent variables on student dissertation progress did not differ for male and female students in this population ($R^2$ change = .0419: F = .6277, df = 9, 72; P > .05).

In order to determine if a given variable in the equation was different from zero while controlling for the effect of other independent variables, the partial regression coefficient associated with each variable was tested for significance, to see if it was significant in influencing the dependent variable. Also, the strength of their respective standardized regression coefficients (*B*), and semi-partial correlation ($r_{sp)}$ were examined in order to interpret relative importance and the degree of influence on student dissertation progress. The results of the regression analyses are given in Table 3.

(Insert Table 3 about here)

Results of the multiple regression analysis (see Table 3) suggest that both students' research self-efficacy and students' relationships with their advisors and committee members significantly contributed to students' dissertation progress. The $R^2$ change for the variables advisor/committee members and advisee relationship and students' research self-efficacy after controlling for the effects of the other vareiables in their respective orders are: $R^2$ change = .135, $F$ = 18.909; df =1; 81; p < .001, and $R^2$ change = .119; $F$ 13.680; df = 1; 82; p 001.

The positive coefficient of the variables, research self-efficacy and advisor and advisee relationships, indicates the positive effects of these variables on dissertation progress. The negative coefficient of the variable measuring students' perception of research environment at first seems unusual; however, it can be explained, especially in light of its positive correlation with other variables of importance such as interaction with advisor, and students' self-efficacy in doing research.

The results of multivariate analysis of variance also indicated that there are significant differences in students' research self-efficacy and dissertation progress between students who held graduate assistantships and those who did not. Students who held some kind of assistantships during the course of their doctoral program exhibited higher self-efficacy in research, and they were also in more advanced stages of their dissertation writings. The assumption of homogeneity of variance covariance matrices was met (Box $F$ =.040, $P$ > .98). The Hotellings $T^2$ for the two groups was found to be significant ($T^2$ Adjusted = 10.41, $F$ = 5.15, df = 2 / 94, P <.01). The subsequent univariate T-test using Bonferonni approach showed that the two groups also differed on each of the two variables. The results indicate that students who have held graduate assistantships have, on average significantly greater level of confidence in conducting research ($F$ for research self-efficacy = 5.16, P < .025, and $F$ for dissertation progress = 9.334, P < .003. These results also qualify the findings of previous research on the effects of graduate assistantships on students academic achievements. Unfortunately because of the small number of participants in each category, this study was not able to test the differences between teaching and research assistantships, which has also been found to be significant in determining students progress.

The result also revealed that the three groups of students from the different departments do not differ in their level of confidence in conducting research, and the status of their dissertation progress is more or less the same across all students in the

three departments. The multivariate test for homogeneity of dispersion matrices indicated that the assumption of homogeneity of variance covariance matrices was met (Box $F$ = .7229, P >.63), and the Wilk's Lambda was found to be non-significant (Lambda = .924, $F$ = 1.850, df = 4 / 186, P > .12). Means and standard deviations for these two variables are given in Tables 4 and 5.

## DISCUSSION

The results suggest that both students' research self-efficacy and students' relationships with their advisors and committee members significantly contributed to students' dissertation progress. In this study students who had higher levels of self-efficacy in research and those who cited more positive and cooperative relationships with their advisors and committee members were also more advanced in their dissertation writing. These effects were consistent for all students, regardless of students' gender, age, degree of financial impediments, and number of years in doctoral program.

It was hypothesized that there would be a relationship between background variables (years in the program, age, gender, finances) and dissertation progress. The study found that none of the students' background characteristics had a significant effect on students' dissertation progress. The non-significant effects of age and gender are consistent with only some of the previous research focusing on gender. Findings regarding gender differences are mixed. While some studies found gender to be related to academic success (Benkin, 1984; Mooney, 1968; Tucker et al., 1964; Williams et al., 1970), others found no relationship between gender and degree completion (Delaney, 1981; Hobish, 1979; Hochberg, 1973; Renetzky, 1966). In this study, gender was not significantly related to dissertation progress.

The result of this study with regard to age of students is also consistent with past

studies that found age not to be predictive of academic achievement of doctoral students (Delaney, 1981; Franklin, 1970; Hassan-shahriari, 1983; Hochberg, 1973; Williams et al., 1970). There have been very few studies that examined the effect of number of years in doctoral program on the dissertation progress, and the findings of these are inconclusive.

While past research has shown that financial difficulties and obligations are significant factors in predicting success in doctoral program (Abedi & Benkin, 1987; Nerad, 1991; Nerad & Cerny, 1993), the results of this study do not substantiate these findings. This could be because at the final stage of the program the effect of finance on students is not as pronounced as during earlier stages for this group of students, and those for whom finances were a large impediment likely dropped out of the program.

It was hypothesized that there would be a positive relationship between students' perception of their research training, research environment, research involvement, and graduate assistantship and dissertation progress while controlling for the effects of background variables. The results of this study partially supported this hypothesis. All measures of students' research experiences, with the exception of research environment, showed positive relationships to dissertation progress. Specifically, students' perceptions of their research training were found to make a significant contribution to their progress. These findings indicate that doctoral students in this study who were more satisfied with their research training and preparation and perceived it as adequate were in more advanced stages of their dissertation. This is in agreement with past research that has found that the more research preparation students have during their doctoral program, the more likely it would be that they would complete their program in a shorter time (Sproul, 1969), and they would have more positive attitudes toward the dissertation process (Cash & Sanches-Huches, 1992).

The students' responses to open-ended items indicated that most students felt that their training in research courses did not prepare them to tackle the complex task of

dissertation research, and therefore they experienced slow progress. Some of the students stated that writing their dissertation was their first real experience in conducting research. Students also expressed their frustration and difficulty in executing the technical requirements of the dissertation such as selecting an appropriate topic, writing the methodology section, data gathering and analysis.

In contrast to the hypothesis, students' perceptions of their research environment had a negative relationship with the dissertation progress. While past research has found that the research training environment has a positive relationship with research productivity (Galassi et al., 1986; Royalty & Magoon, 1985), the findings from this study indicate that those students who found their research environment productive, positive, and encouraging were not as advanced in their dissertation progress. This is in opposition to the previous research that suggested that research productivity and academic achievements are associated with certain aspects of the research training and research environment. It should be noted that both perception of research training and research environment have a significant bivariate relationship with research self-efficacy and advisor and advisee relationships. These sizable relations (see Table 2) of .64 and .52 to other independent variables (research self-efficacy, and advisor and advisee relationship) perhaps caused the significant negative relationship of research environment and dissertation progress. This suggests that both research training and research environment are important factors in predicting students' success, not because of their relationship with the dependent variable (dissertation progress) but because of their sizable relationship to other important predictors of dissertation progress such as research self-efficacy and advisor and advisee relationships. Therefore, their inclusion in any study of doctoral students' dissertation progress is important. This negative effect may also indicate that perhaps a research environment in which the faculty are more involved in their own research, and students are more actively involved in research and working with faculty in conducting research, the less time they spend in conducting their

dissertation research at the final stage of their program. This may also show that although students consider their academic environment conducive to research in general, but this does not necessarily translate into more research productivity for students. This is not necessarily problematic unless students continue working only on faculty research and not on their own.

It was hypothesized that there would be a positive relationship between student and advisor/committee members relationships and dissertation progress after controlling for the effects of background variables and variables related to students' research training and experiences. The result of this study supported the hypothesis and found a significant contribution of student and advisor/committee member relationships to dissertation progress. The significant positive relationship suggests that students who had a good working relationship with the dissertation advisor/chair and committee members were also in more advanced stages of their dissertation. Positive working relations at the final stages are defined as the extent to which students rated the degree of dissertation advisor and committee members support, positive feedback, availability, and interest in students' work.

In the present study, student and advisor/committee members relations was the second most important factor found to influence student dissertation progress, a finding that has been consistently reported in previous studies of doctoral students persistence (Berelson, 1960; Blanton, 1983; Davis & Parker, 1979; Harvey, 1972; Hassan-shahriari, 1983; Jacks et al.,1983). The quality and character of students' relationships with their advisors has been cited as the most sensitive and crucial element in the doctoral program in terms of scholarly development (Heiss, 1970). However, at the final and most critical stage of the program, the nature and role of the advisor changes from interpersonal and social to transmitting skills and knowledge, supervising students' research, and providing guidance (Davis & Parker, 1979). Unfortunately, as was evidenced by students' responses to the open-ended items in this study (the number

two reason given by students for slow progress) and the results of other studies, many doctoral students reported that they get little attention, supervision, and guidance from their major advisor or committee members in the writing of the dissertation. In many cases, the lack of supervision can add to students' sense of frustration and helplessness which can eventually prolong the degree completion or contribute to dropping out of the program (Renetzky, 1966).

It was hypothesized that there would be a positive relationship between students' self-efficacy in research and dissertation progress after controlling for the effects of all other variables. Again, this study produced the expected finding that higher self efficacy in research is positively related to students' dissertation progress. In fact, in this study research self-efficacy was found to be the most important factor influencing students' dissertation progress. High levels of self-efficacy in research in the present study were defined by students' level of confidence in conducting/executing different aspects of the dissertation, such as the literature review, topic selection, writing, and technical aspects related to design and analysis in both quantitative and qualitative mode. This research confirmed previous studies that demonstrated self-efficacy as being an important predictor of students' persistence and academic achievement (Landino & Owen, 1988; Lent, Brown, & Larkin, 1984). More specifically, the finding supported recent research and theory in the area of research self-efficacy and research productivity and dissertation progress among doctoral students (Bako-Okolo, 1996; Geisler, 1995; Phillips, 1993).

Bandura (1977) theorized that self-efficacy or belief in oneself is based on performance accomplishments (previous research experience, involvement), vicarious experience (research environment), verbal persuasion (advisor and advisee relationship), and emotional arousal. Individual's perceived self-efficacy not only affects what knowledge is acquired, but how the individual student will use this information in an achievement setting. According to Bandura (1989) those who believe they can

succeed go on to set higher achievement goals for themselves and are persistent in pursuing their goals in spite of difficulties and setbacks. The positive relation of research self efficacy to research training environment, research involvement, graduate assistantships, advisor and advisee relations, and dissertation progress also affirm the suggestion made by Betz (1986) and Gelso et al. (1988) for applying self-efficacy theory to the area of research training and research productivity.

## Conclusion

The overall findings provide support for the utility of the construct of research self-efficacy in investigating the impact of students' research training and experiences on their dissertation progress. Furthermore, the findings also indicate the importance of the role of faculty advisors and committee members in students' progress during the dissertation stage. The role of faculty not only is critical at early stages of the doctoral program but also at later stages. In this study, students who cited more positive and cooperative relationships with their advisors and committee members were also more advanced in their dissertation writing. Results indicate that the degree and nature of students' contact with their advisor and committee members and their level of confidence in conducting research can enhance or detract from their academic success.

It could be concluded that research self-efficacy is a function of a positive and nurturing research environment and a strong supervisory system of dissertation and mentoring, which in turn can enhance students' success. The effects noted above were consistent for all students, regardless of students' gender, age, degree of financial difficulties, and the number of years in a doctoral program.

## Suggestions For Future Research

Several ideas for the direction of future research in this area have emerged.

This study should be replicated, using the same variables, and a larger sample size in order to increase the generalizability of findings.

Future studies also can test the relationship of sub-components of the research self-efficacy scale with dissertation progress. Students may exhibit different levels of confidence on the two major components related to the writing and organization, and the design and technical aspects.

There is also a need for studies that include measures of students' emotions and attitudes related to research, one of the contributing elements to self-efficacy which were not measured in this study.

A follow-up study can be conducted to see the rate of completion among the same group of students. Finally, future research also should use a more qualitative study such as unstructured interviews and focus groups to gain additional insights about the concerns, needs, experiences, and problems of doctoral candidates at the final stage of their program.

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Table 1: Reliability of Scales

| Scales | Alpha | # of Items |
|---|---|---|
| Perception of Research Preparation | .81 | 3 |
| Research Training Environment | .88 | 9 |
| Research Self-efficacy | .95 | 16 |
| Advisor, Committee/ Advisee Relation | .91 | 15 |

Table 2: CORRELATION MATRIX, MEANS AND STANDARD DEVIATIONS FOR ITEMS AND SCALES

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) Year in program | 1.00 | | | | | | | | | | |
| 2) Age | .562** | 1.00 | | | | | | | | | |
| 3) Gender | .103 | -.095 | 1.00 | | | | | | | | |
| 4) Finance | .073 | .190 | .106 | 1.00 | | | | | | | |
| 5) Research preparation | -.236* | -.310** | .158 | .000 | 1.00 | | | | | | |
| 6) Research environment | -.282** | -.558** | .187 | -.037 | .532** | 1.00 | | | | | |
| 7) Research involvement | -.329** | -.487** | -.009 | -.057 | .346** | .518** | 1.00 | | | | |
| 8) Graduate assistant | -.190 | -.379** | -.025 | -.133 | .292** | .225* | .537** | 1.00 | | | |
| 9) Advisor/ advisee | -.261* | -.516** | .092 | -.071 | .405** | .644** | .357** | .274** | 1.00 | | |
| 10) Research self-efficacy | -.213* | -.276** | -.075 | -.189 | .521** | .302** | .353** | .205* | .282** | 1.00 | |
| 11) Dissert. progress | .018 | -.009 | -.126 | -.120 | .149 | -.027 | .204* | .253* | .286** | .475** | 1.00 |
| Means | 5.563 | 43.344 | 1.289 | 2.010 | 8.760 | 28.258 | 4.320 | 1.485 | 50.844 | 93.804 | 8.021 |
| SD | 2.733 | 9.555 | .455 | 1.021 | 3.008 | 7.172 | 2.196 | .502 | 9.865 | 24.567 | 4.262 |
| Min | 2 | 27 | 1 | 1 | 3 | 14 | 00 | 1 | 19 | 14 | 1 |
| Max | 17 | 63 | 2 | 4 | 15 | 44 | 9 | 2 | 72 | 144 | 17 |

**p<.01. *p<.05

Table 3: Regression Results for Blocks Of Variables Predicting Dissertation Progress

| Variables | | Equation 1 Background Characteristics | Equation 2 Research Experiences | Equation 3 Student and Advisor | Equation 4 Research Self-Efficacy |
|---|---|---|---|---|---|
| Year in Doctoral Program | *B* | .0555 | .0894 | .1020 | .0885 |
| | b | .0859 | .1385 | .1580 | .1371 |
| | $r_{sp}$ | .0445 | .0697 | .0794 | .0689 |
| Age | *B* | -.0240 | .1250 | .1987 | .2067 |
| | b | -.0106 | .0552 | .0878 | .0913 |
| | $r_{sp}$ | -.0188 | .0800 | .1260 | .1310 |
| Gender | *B* | -.1050 | -.0788 | -.0586 | -.0158 |
| | b | -.9909 | -.7439 | -.5534 | -.1493 |
| | $r_{sp}$ | -.1018 | -.0749 | -.0556 | -.0149 |
| Finance | *B* | -.1321 | -.1421 | -.1336 | -.0207 |
| | b | -.5467 | -.5880 | -.5529 | -.0859 |
| | $r_{sp}$ | -.1279 | -.1368 | -.1286 | -.0191 |
| Research Preparation | *B* | | .2452* | .2051 | -.0779 |
| | b | | .3563 | .2980 | -.1132 |
| | $r_{sp}$ | | .2037 | .1696 | -.0543 |
| Research Environment | *B* | | -.1532 | -.4181** | -.3920** |
| | b | | -.0919 | -.2508 | -.2352 |
| | $r_{sp}$ | | -.1069 | -.2570 | -.2408 |
| Research Involvement | *B* | | .2209 | .2846* | .1670 |
| | b | | .4349 | .5603 | .3289 |
| | $r_{sp}$ | | .1526 | .1950 | .1118 |
| Graduate Assistantship | *B* | | .1454 | .0768 | .1336 |
| | b | | 1.238 | .6541 | 1.138 |
| | $r_{sp}$ | | .1090 | .0569 | .0989 |
| Advisor and Advisee interaction | *B* | | | .4788*** | .4739*** |
| | b | | | .2062 | .2041 |
| | $r_{sp}$ | | | .3445 | .3409 |
| Research Self-Efficacy | *B* | | | | .4896*** |
| | b | | | | .0872 |
| | $r_{sp}$ | | | | .3669 |
| $R^2$ | | .0324 | .1698* | .2885*** | .4232*** |
| $R^2$ Change | | .0324 | .1374* | .1186*** | .1346*** |

*p < .05; **p < .01; ***p < .001

Table 4: Means and Standard Deviations for Measures of Research Self-Efficacy and Dissertation Progress

| | Research Self-Efficacy | Dissertation Progress |
|---|---|---|
| **1.Counseling, Educational Psychology & Research** | | |
| Mean | 100.00 | 8.541 |
| Standard Deviation | 24.545 | 3.571 |
| N | 37 | 37 |
| **2. Instruction & curriculum Leadership** | | |
| Mean | 96.500 | 8.000 |
| Standard Deviation | 23.352 | 4.400 |
| N | 26 | 26 |
| **3. Higher Ed and Leadership** | | |
| Mean | 85.00 | 7.471 |
| Standard Deviation | 23.595 | 4.863 |
| N | 34 | 34 |
| **Total** | | |
| Mean | 93.804 | 8.021 |
| Standard Deviation | 24.567 | 4.262 |
| N | 97 | 97 |

**Table 5**: Means and Standard Deviations for Measures of Research Self-Efficacy and Dissertation Progress.

| | Research Self-Efficacy | Dissertation Progress |
|---|---|---|
| **1. No Graduate Assistantship** | | |
| Mean | 88.852 | 6.889 |
| Standard Deviation | 24.194 | 4.178 |
| N | 54 | 54 |
| **2. Graduate Assistantship** | | |
| (Teaching or Research or Both) | | |
| Mean | 100.023 | 9.442 |
| Standard Deviation | 23.862 | 3.972 |
| N | 43 | 43 |
| **Total** | | |
| Mean | 93.804 | 8.021 |
| Standard Deviation | 24.567 | 4.262 |
| N | 97 | 97 |

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