PREVENTING THE "ALL BUT THESIS" PHENOMENON

by

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PREVENTING THE "ALL BUT THESIS" PHENOMENON

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Western Michigan University, 1987

Twenty-three to 54% of the students who enter graduate programs never obtain their degrees. A high percentage of those students drop out after the completion of all the academic requirements except their master's theses or doctoral dissertations. The literature makes reference to the "all but thesis" (ABT) and the "all but dissertation" (ABD) phenomenon.

The present study involved the implementation of a research supervisory system designed to help students complete their theses and dissertations, therefore preventing the ABT and ABD problems. Twenty-nine graduate students in psychology formed the research supervisory group and 53 graduate students from several departments formed a comparison group. Based on a combination of within-subjects and between-group research designs, the data suggest the following conclusions. Generally, in conditions where academic credits depended on research task completion, high performance was generated. However, students who performed under special circumstances, such as extended illness or full-time jobs, did not always obtain that high level. The students in the supervisory system made more progress on their theses and dissertations although they were in their programs for less time than the students in the comparison group. Presumably, this higher rate of progress resulted from the greater amounts of research
supervision received by the students in the supervisory system. Four out of five faculty thesis sponsors evaluated more highly the quality of the MA theses from the students in the research supervisory system than from those not in the system. The two sets of master's theses were evaluated as being essentially equal by the Dean of the Graduate College (2.90 for those students in the system and 2.88 for those not in the system, on a 5-point scale). Of course, these evaluations reflect the values of the particular evaluators.
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Preventing the "all but thesis" phenomenon

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CHAPTER I

INTRODUCTION

Casual observation suggests that graduate students seem especially vulnerable to dropping out of school after completing their course work and before completing their theses or dissertations. This phenomenon is so common that, at the doctoral level, it has often been called the "all but dissertation" (ABD) degree. (In the present paper, the more general term of "all but thesis" [ABT] will be used to stand for "all but dissertation or thesis.")

This paper argues that the ABT phenomenon is a significant problem in higher education, often given little attention by deans, professors, and students. Moreover, this paper also reviews and critiques the research on factors causing the ABT phenomenon and other related problems of higher education. Finally, research is presented dealing with one of the these factors—lack of research supervision.

The Magnitude of the Problem

Twenty-three to 54% of all graduate students entering universities in the United States drop out before they achieve their master's or doctorate degrees (Berelson, 1960; Carter, 1965; Jacks, Chubin, Porter, & Connolly, 1983; Knox, 1970; Lunneborg & Lunneborg, 1973; Naylor & Sanford, 1982; Sells, 1975; Wright, 1964). The College Cost Book (1984) indicates that each student spends...
approximately $5,000 to $10,000 every year in graduate education. This cost includes tuition fees, books and supplies, room and board, personal expenses, and transportation. In addition, as of 1972, the universities spent about $5,000 in graduate training per student. This amount covers staff and facilities (Gardner, 1972). In other words, large investments in graduate education are being made by many students and the universities that do not end in graduate degrees.

Researchers have suggested that the same causes that produce the ABT phenomenon also produce attrition (prior to the completion of course work) and delays in the completion of theses, dissertations, and degrees. Past research on graduate education has emphasized four major causes of attrition and delays in obtaining degrees or completing research projects: (1) low motivation (James, 1980); (2) poor entrance characteristics (Bornheimer, 1984; Hobish, 1978; Lunneborg & Lunneborg, 1973; Oltman & Hartnett, 1985; Sells, 1975); (3) financial problems (Berelson, 1960; James, 1980; Langlois, 1972; Renetzky, 1966; Sells, 1975; Wilson, 1965); and (4) the lack of supervision to complete theses or dissertations (Berelson, 1960; Blanton, 1983; Dillon, Kent, & Malott, 1980; Dillon & Malott, 1981; Gant, Dillon, & Malott, 1980; Heiss, 1970; Malott, 1972; Malott, 1986; Meadowcroft, 1984; Wilson, 1965; Zoia, 1981).

The "All But Thesis" Phenomenon

At the doctoral level, Berelson (1960) reported large numbers of ABDs in the United States. In his study, data from 63 graduate deans indicated a total of approximately 7,400 ABDs. He estimated that
each faculty member had an average of two doctoral students who completed all their course work except their dissertations, and between 3% and 4% of the faculty members in each liberal arts college were such students.

At the master's level, the dean of a graduate school reported that 95% of the students who completed the course work in a master's program in a major university in Latin America never completed their theses (E. Romero, personal communication, July, 1985). (He based this report on an analysis of student records.) Valarino (1986) reviewed all the files of the students in the bachelor's and master's programs of two Latin American universities. Valarino found that 87% of the students who completed all the bachelor's course work failed to complete their theses in the four years required by the program. (A thesis is part of the bachelor's programs in the Latin American universities where she conducted her study.) Valarino also found that 83% of the students who completed all the course work in a master's program in psychology failed to complete their theses in the two years required by these programs. In summary, these studies suggest that the ABT phenomenon affects large percentages of students. Intervening cultural variables, however, should be taken in consideration.

Unfortunately, few data concerning the ABT problem are available. The data presented above are based on unpublished reports from only two Latin American universities which limits their generalization to graduate education.
In part, this lack of data might be the result of the difficulty of their collection. In spite of the fact that thesis credits are recorded in the students' transcripts, such information does not reflect an accurate estimation of thesis progress. Students often register for thesis or dissertation credits without actually working on their theses or dissertations; they do this in order to maintain their full-time student status in the university, for purposes of meeting residence requirements or student loan requirements. In addition, the ABT studies are based on the number of students who did not complete their theses during the time line recommended by their programs. This could be misleading because the students could finish their theses soon after that time. Finally, the ABT data are usually confounded with problems of attrition and delays in completing graduate degrees. For instance, the students not registered in the university for five years after their entrance to a 4-year graduate program could be considered as ABT dropouts. However, some of these students will, no doubt, return to their programs; then such cases would be more properly classified as instances of delay to degrees.

Due to this confounding of graduation problems and the limited data on the number of pure ABT students, the present paper also includes the analysis of attrition and delays, both problems related to the ABT phenomenon. Graduate attrition studies usually do not discriminate among those who drop out at different stages in their graduate programs, let alone those who drop out after completing all the course requirements except their theses. However, the attrition
studies provide a general framework for the analysis of the ABT problem.

**Graduate Attrition**

Several studies reported attrition rates of 23% to 54% in higher education (Berelsohn, 1960; Carter, 1965; Jacks et al., 1983; Knox, 1970; Lunneborg & Lunneborg, 1973; Naylor & Sanford, 1982; Sells, 1975; Wright, 1964). In these studies, instances of attrition often refer to those students who stop taking courses for a specific period of time. Such time varies from one to six years.

Attrition is high across disciplines and across universities. Berelsohn (1960) surveyed a national sample of deans of graduate schools. The deans estimated that 35% to 40% of the doctoral students never get their degrees. Wright (1964) found a 40% attrition rate at the master's level and a 54% rate at the doctoral level at the University of California. Sells (1975) reported a 49% attrition rate among Woodrow Wilson Fellows. Naylor and Sanford (1982) found approximately a 23% attrition rate for master's students and a 41% rate for doctoral students at the University of North Carolina at Chapel Hill. More specifically among students in psychology, Knox (1970) found a 45% attrition rate, and Lunneborg and Lunneborg (1973) reported a 35% attrition rate among PhD students at the University of Washington. Dillon and Malott (1981) found a 43% attrition rate for master's students in psychology at Western Michigan University.

All the studies of attrition have shown high attrition rates.
These studies on graduate attrition contain some weaknesses (Wright, 1964). First, graduate attrition studies often involve subjective reports rather than actual attrition data (e.g., number of academic credit earned as shown in academic records) (Berelson, 1960; Lunneborg & Lunneborg, 1973; Sells, 1975). Second, the data do not eliminate the number of students who stop their graduate programs for a few years and then come back to obtain their degrees. This discontinuity in graduate programs is usually recorded as attrition. Third, ambiguity exists concerning the entrance dates. Axt (1959) said that the methods of reporting and recording graduate student census data are of questionable accuracy. For instance, many students finish their requirements at the master's level and continue taking courses at the doctoral level before being formally accepted into the doctoral programs. Fourth, entering degree goals are not considered (Naylor & Sanford, 1982); some students enter doctoral programs involving a preliminary master's degree, although they plan to get only that master's degree. Then they withdraw after obtaining the master's degree. Therefore, some of the doctoral dropouts could well have been successful master's students.

Delays to Degrees

Students invest an average of eight or nine months longer than the one or two years required to get a master's degree (Dillon & Malott, 1981; Snell, 1965). Students who enter doctoral program with a BA degree spend an average of 12 to 24.1 months longer than the 4
years usually required to get a PhD across universities (mean time of 5 to 6.1 years from the BA to the PhD degree). Students who enter doctoral program with an MA degree spend approximately 15 months longer than the 3 years a full-time student would require without interruptions to achieve the PhD degree (mean time of 4.5 years from the MA to the PhD degree) (Berelson, 1960; Wilson, 1965). More specifically, in psychology, Lunneborg and Lunneborg (1973) and Knox (1970) found that 71% and 72%, respectively, of doctoral students took longer than the four years required for their PhD programs. However, they did not indicate the degree at entry. In conclusion, those who graduate do so in longer time than is required for their graduate programs.

Like attrition studies, the delay data based on university records might be of questionable accuracy, and also the definition of entry date remains ambiguous. Furthermore, the studies in this area do not control for instances of entry that require different interpretations, such as those who get a master's degree in one field and then take doctoral work in another, or make up some deficiencies before being admitted to graduate study, or complete doctoral requirements while formally registered in the master's program (Berelson, 1960). Of the large number of factors that could adversely influence delay and attrition, one that appears relatively common across a number of studies is the problem of completing the thesis or dissertation.
Delays to the Completion of Theses and Dissertations

Completion of the dissertation itself typically involves more than one calendar year, measured in elapsed time from the date of formal approval of the topic. Wilson (1965) reported an average time of 2.0 calendar years to complete a dissertation, while Berelson (1960) found times varying from 1.7 years in physical science to 9 years in education. However, the average time to complete a master's thesis has not been determined.

In the analysis of these delays, it should be noted that students usually do not record the dates and hours they work on their theses or dissertations. Therefore, they might forget when they started to work on their theses or dissertations, reporting inaccurate estimations, thus generating inaccurate data on the time required to complete these long-term projects.

Delays in the completion of theses or dissertations influence attrition because students often get jobs after completing all their course work except their theses or dissertations, hoping they will complete them later. However, the new work environment exerts more control on the ABT student behaviors than the requirement of thesis completion; thus, the students might never complete their degrees (Berelson, 1960; Langlois, 1972).

Delays in the completion of theses or dissertations influence delays in obtaining degrees because students usually begin the thesis or dissertation process relatively late in their graduate programs (Wilson, 1965). Most students begin their dissertations after taking
their qualifying examinations and meeting their other graduation requirements. Approximately 33% of the students in Wilson's (1965) study got formal approval of the dissertation topic after more than 3.0 years of graduate study. Only about 28% of the students in his sample reached this stage before completing approximately 2.0 calendar years of graduate study.

Summary

Three related problems in higher education are attrition, delays toward completing master's or doctoral degrees, and delays toward completing theses or dissertations. Consistently, across disciplines, 23% to 54% of the students who enter graduate programs never graduate, and a high percentage of those students who drop out seem to do so when they have completed all their course work except their theses or dissertations. Those who graduate do so in longer times than that estimated in the graduate programs. The master's students might invest 8 or 9 months longer and doctoral students might invest 12 to 24 months longer than the 3 to 4 years required in their programs. Finally, the fact that doctoral dissertations take approximately two calendar years could increase attrition and cause delays in obtaining graduate degrees.

Causes of the "All But Thesis" Phenomenon and Related Problems

The objective of this section is to consider the possible factors that could explain the ABT phenomenon. As indicated earlier,
the ABT phenomenon is closely related to the other major problems of attrition and delays in completing degrees as well as to the secondary problem of delays in completing research projects. Therefore, some factors could cause more than one problem. Studies have focused on four potential causes: low motivation, poor entrance requirements, financial problems, and lack of supervision for completing theses or dissertations (i.e., task specification, deadlines, feedback, and incentives).

**Low Motivation**

James (1980) has attempted to study the effect of motivation on the persistence of graduate students in the universities. He used a motivational test (Roger Boshier's Education Participation Scale) as a predictor of academic success. He found that those students with the highest scores in the motivational variables called "cognitive interest" and "professional advancement" attained the highest university performance. The dominant "motivation orientations" were significantly different according to age, race, and educational status. For instance, older respondents were mainly motivated by "cognitive interest" and younger respondents were basically motivated by "professional advancement."

Motivation is usually referred to as an internal condition of difficult access (e.g., cognitive interest) (Skinner, 1974). In spite of this major limitation, lack of sufficient motivation is one of the most popular arguments used to explain failures in graduate education. The assumption of low motivation is made when students do
not work effectively toward a long-term outcome (e.g., the completion of a thesis).

However, other explanations could account for failure to achieve long-term outcomes. Procrastination is allowed because any given moment or instance of working toward the long-term outcome does not have sufficient positive or negative reinforcing consequences (e.g., writing a paragraph of the thesis does not result in an appreciable reduction in time to graduation; and putting off for just one more day the writing of such a paragraph will not result in an appreciable increment in anxiety) (Dillon, Kent, & Malott, 1980; Malott, 1984; Malott & Garcia, in press; Malott, Tillema, & Glenn, 1978). In addition, competing behaviors that produce more immediate and stronger consequences displace the long-term research activities (e.g., studying for an exam that will be given the next day.)

**Poor Entrance Characteristics**

Several studies have investigated grade-point averages (GPAs) and admission data (e.g., marital status and age) as predictors of success in graduate school (e.g., progress toward the PhD degree). Among these studies, special attention has been paid to the Graduate Record Exam (GRE). However, as will be discussed, the power of the GRE scores to predict the success of graduate students is far from robust (e.g., Bornheimer, 1984; Lunneborg & Lunneborg, 1973; Oltman & Hartnett, 1985).
Oltman and Hartnett (1985) surveyed faculty in order to identify the most effective admission criteria for predicting success, the GRE among them. They found that the best predictors were the undergraduate GPAs in the major field, letters of recommendation by faculty known by the members of the department, and the undergraduate GPAs in junior and senior years. The GRE was considered useful only when the other credentials of the students were poor.

Other researchers showed that the GRE was less effective in predicting success than other admission criteria. For instance, Lunneborg and Lunneborg (1973) correlated several sets of graduate admission data with the completion of the PhD degree in psychology in four years or less at the University of Washington. The admission data consisted of undergraduate GPAs, GREs, letters of recommendation, undergraduate major, place where previous degree was earned, psychology work experience, research objectives, master's degree at entry, age, marital status at entry, number of children at entry, previous graduate work, and prior university rejection. They found that progress toward the PhD was not highly related to any admission data; instead, the performance in the first year (measured in terms of faculty evaluations and first-year GPA) was the best predictor of later success. However, it would be a mistake to conclude that the admission data were useless. This study had a restricted range of scores because it did not involve rejected applicants. Thus the study could only detect true and false
positives. No data were available relevant to true and false negatives.

Sells (1975) also reported that faculty evaluations of junior students were statistically significant predictors of graduate dropouts among the Woodrow Wilson Fellows. The attrition rate was 38% among students evaluated "excellent," 50% among those evaluated "very good," and 60% among students evaluated "average to dreadful."

The studies presented above indicate that letters of recommendation, faculty evaluations, and first-year GPA correlated with success in graduate school, low attrition rates, and progress toward the PhD degree. However, faculty evaluations and GPAs might be highly correlated with time-management skills, that is the ability to accomplish results on time in circumstances of little or no structure when this accomplishment is achieved by insuring that enough time is invested to complete the task. The completion of theses and dissertations involves such time-management skills. However, similarities and differences in the time-management repertoires cannot be established based on the previous studies; further investigation is needed.

Financial Problems

Another popular explanation of the problems of higher education is economic difficulties (Berelson, 1960; James, 1980; Langlois, 1972; Renetzky, 1966; Sells, 1975; Wilson, 1965). Some surveys support this position. For instance, Berelson (1960) found that PhD recipients from several universities offered economic factors to
explain the delay in getting their degrees. James (1980) and Langlois (1972) also found that economic factors were important determinants of attrition of graduate students.

Rather than asking for the students' opinions, Sells (1975) correlated the number of students who had some kind of financial support with the number of students who dropped out of their programs. She found that 68% of students (n = 5,027) with no support dropped out, while 32% of students (n = 2,387) with some support dropped out. Students often look for a full-time job when they have completed all but their theses or dissertations (Berelson, 1960; Langlois, 1972). Perhaps they believe they will be able to complete their theses while working. Informal observation suggests that those students often end up dropping out of their graduate programs, though rigorous data are not available. An example is the case of universities and colleges that offer full-time jobs to ABT students, especially at the doctoral level. These students get a full-time teaching load that makes it practically impossible for them to complete their degree requirements. At this point it has not been determined whether that initial job seeking is a result of serious economic need or a form of procrastination relative to engaging in the thesis and dissertation work.

For at least three reasons, it is difficult to assess the influence of financial support on the successful completion of theses, dissertations, or degrees: (1) It is not clear if the existing financial support sufficiently solves the economic problems,
because studies do not indicate if the support received is sufficient to pay for the basic academic and living expenses. (2) The studies in this area are based on survey data; and what the students say and the reality of the situations are not necessarily the same. Financial reasons might be socially acceptable excuses the students give to themselves and others but are not necessarily the real causes of attrition and delays. On the other hand, they might often be real causes of attrition. (3) Perhaps students with effective time-management skills (for example) are more likely to be those who receive financial help and they would also be more likely to complete their degree requirements in a timely manner, even without financial help.

In the next section, the possibility is considered that little or no guidance and supervision for doing theses and dissertations is a major cause of attrition of ABT students.

**Lack of Supervision for Completing Theses and Dissertations**

Several studies conducted at Western Michigan University have demonstrated that weekly supervision produces high percentages of research task completion (Dillon, Kent, & Malott, 1980; Dillon & Malott, 1981; Fulton & Malott, 1982; Gant, Dillon & Malott, 1980; Meadowcroft, 1984; Zoia, 1981).

Zoia (1981) found a significant correlation ($r = .70, p < .0001$) between the number of research supervisory meetings and number of BA projects completed on time by students who received a competitive, prestigious research scholarship. In fact, only 32% of the research
projects were completed on time, 36% were completed from one to nine months later than the deadline, and 32% were never completed.

In a study relevant, though indirectly-related, to research supervision, Fulton and Malott (1982) showed that supervision in a structured series of meetings improved the completion of non-recurring tasks with a group of four staff members. (Non-recurring tasks refer to tasks not scheduled on a periodic basis but that needed to be performed on the job.) The structured meeting system consisted of meetings with a supervisor, task assignment forms, weekly deadlines, and deadline monitoring. The dependent variable was the percentage of tasks completed by a deadline. The structured supervisory system improved the supervisees' performance regardless of the importance of the task and the frequency of task assignment.

Some studies have specifically addressed the problem of research completion (Dillon, Kent, & Malott, 1980; Dillon & Malott, 1981; Gant, Dillon & Malott, 1980; Meadowcroft, 1984). These studies evaluated behavioral research supervisory systems for completing BA and MA theses and PhD dissertations. These systems provided detailed task specification, deadlines for task completion, weekly guidance and feedback, and some kind of added incentive system (e.g., letters of recommendation or academic credits).

Gant, Dillon, and Malott (1980) investigated whether or not points toward letters of recommendation acted as an effective incentive for increasing research completion. Eight undergraduate students participated in the study. The students were exposed to all
the variables of the research supervisory system except letters of recommendation (i.e., task specification, deadlines, weekly meetings, and feedback). Any requested letter of recommendation included the cumulative performance of research tasks completed during the experimental phase, the letter of recommendation phase. Their study demonstrated that points toward letters of recommendation increased the research task completion by 12% as opposed to conditions without the letter of recommendation.

Dillon, Kent, and Malott (1980) did a similar study with a population of master's students, investigating the effects of an incentive system consisting of performance-based points toward letters of recommendation combined with weekly feedback. They found that 12 of the 15 students showed a higher rate of completion of weekly tasks when that incentive system was presented than when that incentive system was absent.

Dillon and Malott (1981) followed with a similar research supervisory system. They addressed the identification of an effective incentive system to increase the completion of research tasks and the quality of research, and reduce attrition rates and delays to degrees. They found that the students completed an average of 66% of their weekly assigned tasks when they used only instructions; 76% when they used instructions and feedback; and 91% when they used instructions, feedback and incentives in the form of letters of recommendation.
They also found that during the four years of their study, none of the students withdrew from the supervisory system, while 27% withdrew from the standard system. (The standard group was formed by students supervised by psychology faculty other than those involved in the research supervisory system.) During those four years, 81% of the students under the supervisory system graduated as compared to only 57% from the standard system. Other students in both groups, of course, graduated after the period of study. (Some students had entered the graduate program during the final year of that study. Therefore, they were not expected to graduate during that time.) The master's students in the supervisory group graduated an average of eight months earlier than the students in the standard system. Dillon and Malott (1981) found no differences in the faculty's ratings and publication of theses completed in both groups, in spite of the fact that the research supervisory students completed their degrees in eight months less time. (Three of 14 theses in the supervisory group were accepted for publication, whereas 7 of 41 completed by the standard group were accepted.)

In summary, previous studies have found that supervisory meetings and several incentive systems were effective in increasing research task completion. These effective systems consisted of points toward letters of recommendation only, points toward letters of recommendation combined with weekly feedback, points toward letters of recommendation combined with feedback and instructions, and academic credits. It should be pointed out that this line of research seems to be the only experimental research in the field of
the ABT phenomenon; the other investigations are, at best, correlational analyses, often using opinion surveys rather than direct measures of the factors under study.

However, there are also limitations to the studies of research supervisory systems. Although Dillon and Malott (1981) compared between groups in terms of thesis progress, attrition rate, delay to degrees, and thesis quality, their study had some weaknesses. (a) The selection of the students who participated in the control group and those who did not may have been biased. Their experimental group consisted of all of the advisees of the second author, while the control group consisted of students who voluntarily answered a survey at the end of several classes conducted in the Psychology Department. (b) The faculty's quality ratings might have been biased toward the theses with which they were involved. In addition, the acceptance of publication might have been strongly influenced by the publication skills of specific faculty members. Indeed, 71% of the publications of the standard group were supervised by the same faculty member.

Summary

The previous research has focused on four possible factors influencing the ABT phenomenon: low motivation, poor entrance requirements, financial problems, and lack of supervision to complete theses and dissertations. All these factors may be relevant to the ABT problem. Motivation and academic skills could be considered factors resulting from the individuals' behavioral
histories; whereas financial need and lack of structure could be considered factors involved in the immediate contingencies controlling the student's research behavior. However, the relative influence of these factors on the ABT phenomenon needs to be investigated further. All of these factors are amenable to experimental manipulation. For instance, one could study the effects of special skills development programs or of funding on the completion of theses and dissertations. The present study, described in the remainder of this paper, is an investigation of one of these factors, the effects of supervision on the completion of research projects.

Objectives of the Present Research

The present study is an analysis of research supervisory systems designed to help the students complete their theses and dissertations; it is based on the assumption that time-management problems are a significant factor in difficulties with thesis and dissertation completion. The study involves a variation on the research supervisory system of Dillon and Malott (1981).

The nature of the present study has shifted as a consequence of the ongoing results. In a pilot replication of Dillon and Malott's (1981) research supervisory system, Meadowcroft (1984) found that some relevant research tasks were ignored in the weekly tasks specified by the researchers and their supervisors, resulting in delays in the completion of the research projects (e.g., timeliness on the application of human subjects procedures and failure to plan
recruitment of subjects). Therefore, the initial purpose of the present study was to replicate Dillon and Malott's supervisory system adding more detailed task specification. So, in the present study, the required tasks common to all theses and dissertations were specified in research contracts by the coordinator of the supervisory system. In Dillon and Malott's supervisory system, the researchers and their immediate supervisors specified the weekly tasks.

In early stages of this research, however, the average student performance was considerably below that obtained by Dillon and Malott (1981). As a result, an analysis of the effects of different incentive systems was added to this research. Other differences are the use of a larger comparison group than the one used by Dillon and Malott and the addition of thesis quality evaluations independent from those of the students' committee members.
CHAPTER II

METHOD

Subjects

Students in the Research Supervisory System

Twenty-nine graduate students from the Psychology Department at Western Michigan University participated in this study. They registered for thesis or dissertation credits during the time of this investigation. The students varied across academic level (24% were doctoral students and 76% master's students), phase of their research (48.3% were in the initial or generating phase, 41.4% in the data collection or implementing phase, and 10% in the writing phase), sex (79% females and 21% males), and race (38% black Americans, 41% white Americans, and 21% white foreign students).

Participation in the research supervisory system was offered to all the graduate students under the supervision of on faculty advisor. In addition, five students of other advisors asked to participate in the study (two doctoral students and three master's students).

The students who wished to participate in this study signed an informed consent form that specified the objectives of the study and the conditions of participation (see Appendix A). The form also indicated that the students could drop from the study at any time without penalty.
Students Not in the Research Supervisory System

Three groups of students not participating in the research supervisory system were selected in order to compare their performance with the students in the system. Group 1 was used to compare thesis progress and supervision received from the advisor. Groups 2 and 3 were used to compare the thesis quality.

Group 1

This group contained students selected from the list of active graduate students of the College of Arts and Sciences at Western Michigan University. Active students were those who took at least one course during the academic year 1985-1986. The departments selected were those that offered PhD degrees or required a master's thesis or similar research project for the MA degree. Research projects are an option in the Industrial Psychology master's program and were selected by some students in the research supervisory system. (The main difference between projects and master's theses was that projects did not answer research questions, for instance, questions requiring demonstration of functional relationships between dependent and independent variables.) The departments selected were Accountancy, Anthropology, Biology, Biomedical Sciences, Business, Chemistry, Communication Arts and Sciences, Computer Science, Earth Science, Economics, Geography, Geology, History, Medieval Studies, Music, Occupational Therapy, Physics, Political Science, Psychology, Sociology, and Speech Pathology and Audiology.
Nine hundred and thirty students were randomly selected from a list of 1,860 students. A written informed consent form was mailed to students to request permission to use information available in the university files (entry and cumulative GPA, cumulative hours earned, hours earned per semester, citizenship, race, and sex) (see Appendix A).

Group 2

Group 2 contained all the graduate students in psychology who had a thesis oral examination in 1986.

Group 3

This group was formed by all the graduate students of Western Michigan University who turned in their theses, specialist projects, or dissertations to The Graduate College during 1986.

Settings

Two settings were used, both located in the Psychology Department of Western Michigan University. The experimenter, a research assistant, and each student in the system had a mailbox in the Center for Self-Management of Academic Performance where the data forms were collected and the system's materials distributed (e.g., feedback and social validation forms). The other setting was a graduate seminar in behavioral systems analysis where the students presented their thesis work once every semester.
Procedures

Within-Group Procedures

Advanced students acted as research supervisors for less advanced students. Six out of seven doctoral students supervised master's students on a bi-weekly basis. (The exception was a doctoral student who was in the system only one semester.) Two faculty advisors supervised doctoral students on a weekly basis and master's students on a bi-weekly basis. One of these two faculty advisors supervised four doctoral students and 20 master's students. Five advanced master's students supervised less advanced students when there were too few doctoral students to supervise all the master's students in the system.

The contingencies for supervisors varied according to the academic level of the students. Doctoral students received academic credit when they supervised approximately three students per semester for three semesters. Most master's students received practicum points in a graduate seminar for supervisory activities. If research was published, supervisors who contributed significantly to the student's work became second authors of the publication versions.

Standard Procedures

The standard procedures consisted of a research supervisory system package, involving weekly research contracts, points, instructions, supervisory and advisory meetings, and feedback.
Research Contracts. The basic data collection forms consisted of a set of 39 weekly research contracts (see Appendix B). The research contracts specified weekly tasks, proof of accomplishment, and possible points for each task. Blank spaces were included for recording points earned and time invested per week.

The students received a set of 13 research contracts every semester. Each set corresponded to a research phase: generating, implementing, or writing. Approximately 80% of the tasks specified in the contracts were common to all the students in a given phase; the other 20% were unique to individual research and were specified by the student, supervisor, and advisor.

Points. The tasks specified in the research contracts were assigned point values. One point was earned for each of the following accomplishments: notes or signatures from scheduled meetings attended (usually lasting an hour), literature review forms filled out based on six pages of a journal article or 20 pages of a book (see Appendix C), tables and graphs based on one hour of data processing, and evidence of an hour performing non-recurring tasks (e.g., identifying a research setting).

Instructions. The students and their supervisors received a set of written instructions compiled in the first part of a research manual (Garcia, 1987). The instructions involved general procedures of the research supervisory system and guidelines for using the research contracts, finding relevant research articles, and preparing research presentations.
The experimenter reviewed the instructions and procedures of the system in a coordination meeting conducted the first week of each semester. The students and their supervisors were tested on relevant items. If they answered more than one question incorrectly, the correct answers were explained and a parallel test was administered. (The test used is presented in Appendix D.)

**Supervisory and Advisory Meetings.** The supervisory meetings occurred once a week. During these meetings the research supervisor discussed research issues and reviewed the proofs of accomplishments, the accuracy of the data recorded in the contracts, and activities programmed for the following week. Doctoral students were supervised by their faculty advisors. When a student or supervisor canceled a supervisory meeting, rescheduling was required for the same week.

The MA students' advisory meetings occurred once every two weeks with the advisor and once every semester with the second and third thesis committee members. Doctoral students also met once every semester with their fourth committee member. During these meetings, design, methodology, implementation, and writing of the theses or dissertations were discussed.

**Feedback.** The students received feedback every week showing the weekly and cumulative percentage of tasks completed by each student and the group, and the scores on research presentations (see Appendix E).
System Maintenance. System maintenance procedures were implemented to assure that the students turned in the research contract with proofs on time, thus facilitating the efficiency of the research supervisory meetings. System maintenance procedures varied each semester. In Semester 1, the students earned points for turning in the research contract and evidence of task completion on time, filling it out before the supervisory meetings, and having all the system's materials organized in a 3-ring notebook. In Semester 2, the students earned points only for turning in the research contract on time and having all proofs paper clipped to the contract. In Semester 3, the students earned points for filling out the possible points' column of the following week's contract and lost points for turning in the contract late. (When the students did not turn in the research contract, they were asked to report the tasks completed and to show proof of accomplishment.)

Special Procedures: Independent Variables

This study involved four special procedures: letter of recommendation alone, letter of recommendation and semester credit/no-credit contingency, letter of recommendation and bi-weekly credit/no-credit contingencies, and no letter of recommendation.

Letter of Recommendation Alone. During this condition, it was stipulated that the percentage of points earned and the rank of the student's performance in relation to other students would be included in any letter of recommendation written by the primary faculty.
advisor of the system. These data would be used when the letter of recommendation was solicited either during or after this condition. The students received a blank model of the letter at the beginning of the study (see Appendix F); however, the letters were directly sent to the solicitor upon request.

**Letter of Recommendation and Semester Credit/No-Credit Contingency.** Under the letter of recommendation and semester credit/no-credit contingency condition, the students received the same information as in the condition of the letter of recommendation alone. The students received no academic credit if their cumulative percentage of task completion was 84% or lower by the end of the semester. (The students received an Incomplete for thesis credits when their cumulative percentage of task completion by the end of the semester was 85% or higher. When the students completed their theses, the Incompletes were replaced by academic credits.) When the students registered late for work done in previous semesters, the semester credit/no-credit contingency was applied retroactively. Those who were doing a project and got 84% or less by the end of the semester received the failing grade of CD.

**Letter of Recommendation and Bi-Weekly Credit/No-Credit Contingency.** The difference between the letter of recommendation and bi-weekly credit/no-credit contingency and the previous condition was that the credit/no-credit contingency was applied every other week, and not at the end of the semester. Those students who got a cumulative percentage of task completion of 84% or less during two
consecutive weeks were dismissed from the system and received no credit (in the case of master's theses or doctoral dissertations) or a failing grade of CD (in the case of master's research projects).

No Letter of Recommendation. The performance of the students during the no letter of recommendation phase was not included in any letter of recommendation solicited at that time or any other time. Thus, their performance level was not made public.

Dependent Variables

The percentage of weekly research tasks completed was the main dependent variable. The research tasks consisted of attending supervisory and advisory meetings, writing, reading, collecting and graphing data, performing non-recurring tasks, and having oral thesis presentations. Non-recurring tasks were tasks unique to each individual study. They occurred once or twice during the research project (e.g., recruiting students; filling out the appropriate human subjects forms).

During the generating phase, the students defined their thesis topics, reviewed the relevant literature, conducted pilot studies, and wrote their thesis proposals. During the implementing phase, the students recruited subjects, conducted the experiment, collected and graphed the data, and included measures of accuracy, reliability and inter-observer agreement. During the writing phase, they wrote their final drafts, had the oral examinations, and submitted their theses to The Graduate College.
Attending Meetings. The evidence for attending supervisory meetings was a filled-out meeting form (the recurring-task agenda for supervisors) (see Appendix G). Proofs of other meetings were signatures or notes. The students attended three different meetings: (1) weekly meetings with a research supervisor for approximately an hour, (2) bi-weekly meetings with the advisor for approximately 30 minutes (given that the advisors of the doctoral students acted as supervisors, the doctoral students met with their advisors for approximately an hour every week), and (3) a meeting each semester with the members of the thesis committee for approximately 30 minutes.

Writing. The evidence of writing was double-spaced, typed pages. Written products were primarily required in the generating and writing phases. (The research proposal was written in the generating phase and the final draft of the thesis or dissertation was written in the writing phase.)

Reading. The evidence of reading was filled-out literature review forms. The master's students read approximately 18 relevant references and the doctoral students 54 during the generating phase.

Data Collection. The evidence of data collection was tables and graphs with weekly data. The students showed evidence of data collection in the generating (pilot study) and implementing phases. They collected data for approximately six weeks in the generating
phase and 12 weeks in the implementing phase. However, this varied according to the nature of each study.

**Non-Recurring Tasks.** The students and the supervisors specified the evidence of each non-recurring task in advance during the supervisory meetings. Additional non-recurring tasks assigned by the advisors and professors of the thesis committee were recorded in the research contracts and reviewed by the supervisor.

**Research Presentations.** The students had oral presentations of their theses once a semester in a graduate seminar. The presentations consisted of approximately 15 minutes of exposition and 10 minutes of discussion.

**Between-Group Procedures**

**General Procedures**

**Group 1.** A survey (see Appendix H) and an informed consent form (see Appendix A) were mailed in Semester 1 to each of the students in Group 1. The survey included questions concerning thesis progress, supervision, academic history, and work history while studying in the graduate program.

**Group 2.** At the time of the oral examination, all the students involved in Group 2 received a letter describing the objectives of this study and soliciting permission to see their faculty evaluations of their theses. In addition, the advisor and the thesis committee
members received thesis evaluation forms with a letter indicating the purposes of this study (see Appendix A).

Group 3. The Dean of the Graduate College filled out an evaluation form after reading each thesis, project, and dissertation submitted to The Graduate College.

Comparisons Between the Research Supervisory Group and Other Groups

Students Characteristics. The research supervisory group and Group 1 were compared according to their cumulative GPA, sex, race, age, months in the graduate program, academic credits registered when working in the thesis, and number of non-academic work hours per week.

The accuracy of measures was checked by contrasting responses to the survey with some of the data available in the university records (e.g., academic history, entry date, and total credit hours taken). Other information, such as cumulative GPA and credits taken per semester, was taken directly from the computerized records of the university.

Thesis Progress. Thesis progress was measured in terms of whether the students defined the thesis topic, read 13 or more articles, began or finished collecting data, wrote the first or final draft, or had the oral examination.

Supervision. Supervision was measured in terms of advisor's help to define the thesis topic, frequency of advisory meetings,
yumber of tasks specified by the advisor, feedback and incentives given by the advisor, and help from the thesis committee members.

**Thesis Quality.** Quality evaluations were filled out by the Dean of The Graduate College and the professors of the Psychology Department. They evaluated the significance of the study, literature review, method, results, conclusions and discussions, writing style, organization, and overall thesis (see Appendix I).

**Experimental Design**

**Within-Group Comparisons**

The students in the research supervisory system were exposed to different combinations of conditions according to the number of semesters they were in the system (see Table 1). Data were collected for three semesters: Semesters 1, 2, and 3 (total of 39 weeks, 13 weeks per semester).

In Semester 1, the students were exposed to the letter condition for 13 weeks. In Semester 2, the students were exposed to the letter and semester credit/no-credit contingency for the initial five weeks. Those who achieved a cumulative percentage of 85% or higher were exposed again to the letter condition from the last eight weeks of that semester. Those with lower cumulative percentage than 85% by the end of the first five weeks, continued on the letter and semester contingency until they achieved passing criteria. In Semester 3, the students were exposed to four weeks of the letter and bi-weekly
credit/no-credit contingency, followed by four weeks of the no letter condition and five weeks of the letter and bi-weekly contingency.

Table 1

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<th>Number of Students Exposed to Different Experimental Conditions</th>
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Legend. C/N-C = credit/no-credit contingency.

Note. Three students involved in the supervisory system for less than five semesters were not included.

Between-Group Comparisons

The student characteristics were compared by checking the responses to the surveys and in the university records. The comparison of thesis progress and supervision received was based only on the student's responses. In addition, the mean of rating by
faculty and The Dean of The Graduate College were computed for those theses completed in the research supervisory system and those completed elsewhere.
CHAPTER III

RESULTS

Within-Group Results

Generally, the conditions in which academic credits depended on research task completion generated higher performance than the condition in which letters of recommendation were based on performance and the condition in which the letters of recommendation were not given. In some cases, the requirement that the cumulative percentage of research task completion could not fall below 85% for two weeks in a row may have increased the performance more than the requirement that 85% must be achieved by the end of the semester. In some cases, the requirement that the letters of recommendation would include references to the percentage of tasks completed may also have generated higher performances than when this requirement was absent. However, the two latter effects were not consistent in the present experiment.

In the following paragraphs, the data are analyzed in more detail according to whether the students were under the standard or special circumstances of the experiment.

Standard Circumstances

Standard circumstances consisted of simultaneous work on the thesis or dissertation and other academic requirements, such as course work and comprehensive examinations. (This term was used to
describe the conditions characteristic of most students involved in the research supervisory system and not necessarily the conditions of graduate students in general.

Legend. Let. = letter; Let. + S. = letter and semester contingency; Let. + BW = letter and bi-weekly contingency; No Let. = no letter.

Figure 1. Research Tasks Completed Under Standard Circumstances of Students Exposed to More than One Condition.
### Table 2
Mean Percentages of Research Task Completion

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**Legend.**  
N = number of students (three students involved for less than five weeks were not included); Let. = letter condition; Let. + Sem. = letter and semester contingency; Let. + BW = letter and bi-weekly contingency; No Let. = no letter condition; * = Special circumstances began and maintained during the study.

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Figure 1 and Table 2 show that the addition of the semester credit/no-credit contingency was associated with an increment in the performance (98% and 105%) over the letter-only conditions (55% and 79%) (first and second sets of data). When these conditions were reversed, and the letter-only condition was presented, the performance decreased (83%, 103%, and 95%) (first three sets), but not to the low percentage obtained in the initial letter condition (first two sets). (The weekly mean percentages of research task completion of each student are presented in Appendix J.)

Figure 1 and Table 2 also show that the performance increased under the bi-weekly credit/no-credit contingency (93% and 104%) over the performance under the letter condition (83% and 95%) (first and second sets). The performance decreased under the no letter condition (66% and 94%) over the performance under the letter and bi-weekly contingency (first and third sets). However, the research task completion was high under both credit conditions.

Figure 2 shows a considerable increase in performance from the letter condition to both credit contingencies, across students. These students were involved in the research supervisory system for only one semester. However, the average data of the six students exposed to the letter condition only could be misleading because these students presented two distinctive trends (first set). On the one hand, performance of two of the six students increased throughout the semester. Although both students expected to graduate at the end of Semester 1, only one graduated and the other graduated at the end
of the following semester. The performance of the remaining four students decreased through Semester 1, and none of them participated in the system the following semester. (Three of these students continue in their graduate programs, two graduated, and one moved out of town and began an internship.)

Legend. Let. = letter; Let. + S. = letter and semester contingency; Let. + BW = letter and bi-weekly contingency; No Let. = no letter;
+ = Exceeds 120%.

Figure 2. Research Tasks Completed Under Standard Circumstances of Students Exposed to Only One Condition.
**Legend.**
- Let. = letter; Let. + S. = letter and semester contingency;
- Let. + BW = letter and bi-weekly contingency; No Let. = no letter;
- + = Exceeds 120%.

**Figure 3.** Research Tasks Completed Under Special Circumstances.

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Special Circumstances

The circumstances that seemed to make it especially difficult to work on theses or dissertations involved finishing the course work prior to the completion of the thesis or dissertation and thereby decreasing contact with the academic environment, having serious personal problems (e.g., extended illness), moving out town, working full-time, and working in graduate programs in other universities. The identification of the specific circumstances associated with each individual case was not included in the following analysis in order to protect the identity of the participants. However, this protection does not greatly affect the value of the analysis, because it would not be possible to separate the relative effects of each special circumstance from other factors peculiar to each student. Therefore, the special circumstances are dealt with as a general class of variables that seem to affect performance.

Figure 3 (second and fifth sets) shows that under the semester credit/no-credit contingency, three out of five students under special circumstances received the grade of no credit; whereas under a more demanding condition, the bi-weekly contingency, the performance was high for two out three students who received the grade of credit when this contingency was in effect (third and fourth sets). (Although the average weekly percentage of one of these two students was 51% during the second implementation of the bi-weekly contingency, this student's cumulative percentage did not fall
below 85% at the end of that semester [see Table 2, second set related to Figure 1].) However, the performance of two students fell below 85% for two or more consecutive weeks under the bi-weekly contingency, causing them to receive the grade of no credit that semester (first and fifth sets). One of these two students fell under special circumstances at the beginning of the semester when the bi-weekly contingency was implemented, and those circumstances continued through out the semester. However, the performance of this student satisfied the semester contingency requirements under standard circumstances (first set). The performance of the other student was not affected by either the semester contingency or the bi-weekly contingency. In summary, the credit contingencies seemed to help some, but not all of the students under special circumstances.

Social Validation

Table 3 shows the results of the anonymous social validation questionnaires given to students each term they were in the system (see Appendix K). (Table 3 includes the answers of the students who withdrew after one or more semesters of participation in the research supervisory system.) In general, the students were pleased with all features of the research supervisory system. Four features of the system received the modal ranking of 1 (excellent) on social validation questionnaire: structure of the supervisory meeting (63%), contribution of the research supervisor (63%), contribution of the advisor (59%), and outline of thesis (40%).

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### Table 3

**Social Validation Results**

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Poor</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>NA</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Structure of the Supervisory Meeting</td>
<td>49</td>
<td>63</td>
<td>25</td>
<td>4</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contribution of Research Supervisor</td>
<td>49</td>
<td>63</td>
<td>30</td>
<td>2</td>
<td></td>
<td>--</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contribution of Advisor</td>
<td>46</td>
<td>59</td>
<td>26</td>
<td>4</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Contracts</td>
<td>49</td>
<td>45</td>
<td>45</td>
<td>10</td>
<td></td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outline of Thesis</td>
<td>48</td>
<td>40</td>
<td>35</td>
<td>10</td>
<td></td>
<td>--</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literature Review Forms</td>
<td>47</td>
<td>38</td>
<td>38</td>
<td>17</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Presentations</td>
<td>45</td>
<td>36</td>
<td>36</td>
<td>4</td>
<td></td>
<td>--</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordination Meeting</td>
<td>48</td>
<td>29</td>
<td>52</td>
<td>8</td>
<td>2</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback Form</td>
<td>49</td>
<td>27</td>
<td>41</td>
<td>20</td>
<td>8</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience as Supervisor</td>
<td>44</td>
<td>14</td>
<td>23</td>
<td>11</td>
<td>2</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Legend.**  
N = total number of responses to a particular item over three semesters, including evaluations of the same students who were in the supervisory system for more than one semester. NA = not applicable.

**Note.** Data refer to percentages of students ratings on a 4-point scale. The percentages were rounded to the nearest whole number.
Three features received a modal evaluation in which the ratings of 1 and 2 were identical: research contracts (45%), literature review forms (38%), and research presentations (36%). Three features received a modal evaluation of 2: coordination meeting (52%), feedback form (41%), and experience as supervisor (23%). No features received modal rankings lower than two. (It is not possible to determine the exact number of different students who filled out the evaluations in the three semesters the social validation questionnaire was used because not every student filled it out every semester, the majority of the students were in the system for more than one semester, and the evaluations were filled out anonymously.)

In addition, 79% of those who acted as supervisors said they wished to continue being supervisors the following semester, and 89% of the students indicated they wished to continue participating as supervisees in the system.

Nine out of 29 (31%) students, however, actually chose to not continue in the system. The reasons involved having new job demands that caused the interruption of all academic work (1), not having enough time to meet the requirements of the system (5), and/or, finding help from supervisors or advisors outside the system (3). Two students did not give any reason.
Between-Group Results

Thesis Progress

Students participating in the system were compared with students not in the system to determine relative amounts of progress by members of each group. A higher proportion of the master's and doctoral students of the research supervisory group had defined the thesis or dissertation topic, collected data, and written the first draft of the thesis. In addition, the master's students of the research supervisory group had read more articles than those not participating in the supervisory system group (see Tables 4 and 5). However, a higher proportion of the master's students not participating in the supervisory group had written the final draft of their theses and were more likely to have had their oral examinations. Of course, this might be expected because the students in the supervisory group had been in the master's program an average of 13 months less than those not in the system. The doctoral students not participating in the supervisory system had read more articles related to their dissertations. However, this might also be expected because the students in the supervisory system had been in the program 29 months less than those not in the supervisory system. (The data in Tables 4 and 5 were based on the responses to 66 surveys received out 960 (6.9%) originally mailed, including students in the research supervisory system.)
Table 4
Thesis Progress of Master's Students

<table>
<thead>
<tr>
<th>Partial Progress</th>
<th>Participating in the Supervisory System</th>
<th>Not Participating in the Supervisory System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defined Thesis Topic</td>
<td>100% (11/11)</td>
<td>61% (28/46)</td>
</tr>
<tr>
<td>Read 13 or More Articles</td>
<td>90% (9/10)*</td>
<td>54% (25/46)</td>
</tr>
<tr>
<td>Wrote Proposal</td>
<td>73% (8/11)</td>
<td>52% (24/46)</td>
</tr>
<tr>
<td>Started Collecting Data</td>
<td>82% (9/11)</td>
<td>52% (24/46)</td>
</tr>
<tr>
<td>Finished Collecting Data</td>
<td>64% (7/11)</td>
<td>52% (24/46)</td>
</tr>
<tr>
<td>Wrote First Draft</td>
<td>54% (6/11)</td>
<td>39% (18/46)</td>
</tr>
<tr>
<td>Wrote Final Draft</td>
<td>9% (1/11)</td>
<td>17% (8/46)</td>
</tr>
<tr>
<td>Had Oral Examination</td>
<td>--</td>
<td>15% (7/46)</td>
</tr>
</tbody>
</table>

Legend. ( ) = proportion of responses per item; * = 10 out of 11 students answered this item.

The students in the research supervisory group had completed more tasks even though their mean cumulative grade point average was lower (3.29 vs. 3.73 for master's students and 3.62 vs. 3.88 for doctoral students), the time in the program from entry to the date of the survey was shorter (15 months vs. 28 months for master's students and 16 months vs. 45 months for doctoral students), and the number
of academic credits taken simultaneously with the thesis work was higher (8.4 vs. 2 credits for master's students and 3.3 vs. .7 for doctoral students) than those of the students not participating in this system.

Table 5
Dissertation Progress of Doctoral Students

<table>
<thead>
<tr>
<th></th>
<th>Participating in the Supervisory System</th>
<th>Not Participating in the Supervisory System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defined Thesis Topic</td>
<td>100% (2/2)</td>
<td>86% (6/7)</td>
</tr>
<tr>
<td>Read 13 or More Articles</td>
<td>50% (1/2)</td>
<td>86% (6/7)</td>
</tr>
<tr>
<td>Started Collecting Data</td>
<td>100% (2/2)</td>
<td>43% (3/7)</td>
</tr>
<tr>
<td>Finished Collected Data</td>
<td>50% (1/2)</td>
<td>43% (3/7)</td>
</tr>
<tr>
<td>Wrote First Draft</td>
<td>50% (1/2)</td>
<td>29% (2/7)</td>
</tr>
<tr>
<td>Wrote Final Draft</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Had Oral Examination</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Legend. ( ) = proportion of responses per item.

Other differences among groups were racial composition (the majority of the research supervisory group was formed by black Americans, while the majority of the other group consisted of white Americans), and age (the master's students in the supervisory system
averaged two years younger and the doctoral students eight years younger than those not in the system).

Table 6
Characteristics of Master's Students in the Research Supervisory System and Master's Students Not in the System

<table>
<thead>
<tr>
<th>Participation in the Supervisory System</th>
<th>Not Participating in the Supervisory System</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>17</td>
</tr>
<tr>
<td>Grade Point Average</td>
<td>3.29 (n=17)</td>
</tr>
<tr>
<td>Sex: Female</td>
<td>65% (n=11)</td>
</tr>
<tr>
<td>Male</td>
<td>35% (n=6)</td>
</tr>
<tr>
<td>Race: White American</td>
<td>29% (n=5)</td>
</tr>
<tr>
<td>Black American</td>
<td>41% (n=7)</td>
</tr>
<tr>
<td>Foreign Student</td>
<td>29% (n=5)</td>
</tr>
<tr>
<td>Age Average</td>
<td>26 (n=16)</td>
</tr>
<tr>
<td>Time in Program (months)</td>
<td>15 (n=17)</td>
</tr>
<tr>
<td>Credits Simultaneously with Thesis</td>
<td>8.4 (n=17)</td>
</tr>
<tr>
<td>Work (hours/week)</td>
<td>17 (n=16)</td>
</tr>
</tbody>
</table>

Legend. N = students in the group; n = students with data available.

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Table 7
Characteristics of Doctoral Students in the Research Supervisory System and Doctoral Students Not in the System

<table>
<thead>
<tr>
<th></th>
<th>Participating in the Supervisory System</th>
<th>Not Participating in the Supervisory System</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Grade Point Average</td>
<td>3.62 (n=3)</td>
<td>3.88 (n=3)</td>
</tr>
<tr>
<td>Sex:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>33% (n=1)</td>
<td>57% (n=4)</td>
</tr>
<tr>
<td>Male</td>
<td>67% (n=2)</td>
<td>43% (n=3)</td>
</tr>
<tr>
<td>Race:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White American</td>
<td>33% (n=1)</td>
<td>86% (n=6)</td>
</tr>
<tr>
<td>Black American</td>
<td>67% (n=2)</td>
<td>--</td>
</tr>
<tr>
<td>Foreign Student</td>
<td>--</td>
<td>14% (n=1)</td>
</tr>
<tr>
<td>Age Average</td>
<td>27 (n=3)</td>
<td>35 (n=7)</td>
</tr>
<tr>
<td>Time in Program (months)</td>
<td>16 (n=3)</td>
<td>45 (n=5)</td>
</tr>
<tr>
<td>Credits Simultaneously with Thesis</td>
<td>3.3 (n=3)</td>
<td>.7 (n=4)</td>
</tr>
<tr>
<td>Work (hours/week)</td>
<td>25 (n=3)</td>
<td>38 (n=5)</td>
</tr>
</tbody>
</table>

Legend.  N = number of students in the group; n = number of students with data available for a specific item.

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Table 8
Supervision of Master's Students

<table>
<thead>
<tr>
<th></th>
<th>Participating in the Supervisory System</th>
<th>Not Participating in the Supervisory System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helped to Define Thesis Topic</td>
<td>100% (10/10)</td>
<td>43% (20/46)</td>
</tr>
<tr>
<td>Meetings:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekly</td>
<td>30% (3/10)</td>
<td>15% (7/45)</td>
</tr>
<tr>
<td>Bi-Weekly</td>
<td>70% (7/10)</td>
<td>29% (13/45)</td>
</tr>
<tr>
<td>Rarely or Never</td>
<td>--</td>
<td>56% (25/45)</td>
</tr>
<tr>
<td>Task Specification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekly</td>
<td>100% (8/8)</td>
<td>7% (7/44)</td>
</tr>
<tr>
<td>Bi-Weekly</td>
<td>--</td>
<td>11% (5/44)</td>
</tr>
<tr>
<td>Rarely or Never</td>
<td>--</td>
<td>82% (36/44)</td>
</tr>
<tr>
<td>Feedback</td>
<td>100% (9/9)</td>
<td>30% (14/8)</td>
</tr>
<tr>
<td>Incentives</td>
<td>90% (9/10)</td>
<td>4% (2/46)</td>
</tr>
<tr>
<td>Sponsors Help</td>
<td>38% (5/8)</td>
<td>21% (7/27)</td>
</tr>
</tbody>
</table>

Legend. ( ) = proportion of responses per item.

The sex composition was only different for doctoral students. (The research group was 67% males and the other group 33%) (see Tables 6 and 7). (The data of Tables 6 and 7 were extracted from the
surveys and the computerized records of the university, such as transcripts and demographic information.)

<table>
<thead>
<tr>
<th>Table 9</th>
<th>Supervision of Doctoral Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participating in the Supervisory System</td>
</tr>
<tr>
<td>Helped Defining Thesis Topic</td>
<td>50% (1/2)</td>
</tr>
<tr>
<td>Meetings:</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>Bi-Weekly</td>
</tr>
<tr>
<td></td>
<td>Rarely or Never</td>
</tr>
<tr>
<td>Task Specification</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td>Bi-Weekly</td>
</tr>
<tr>
<td></td>
<td>Rarely or Never</td>
</tr>
<tr>
<td>Feedback</td>
<td>100% (2/2)</td>
</tr>
<tr>
<td>Incentives</td>
<td>100% (2/2)</td>
</tr>
<tr>
<td>Sponsors Help</td>
<td>50% (1/2)</td>
</tr>
</tbody>
</table>

Legend. ( ) = proportion of responses per item.
**Supervision**

However, the most conspicuous difference between the two groups was the supervision received. In comparison with the master's students not participating in the research supervisory system, those master's students in the system said they received more help in defining the thesis topic, more meetings (once or twice a week), more task specification (at least one a week), more feedback and more incentives from their advisors, and more supervision from their sponsors (see Table 8). The same applies to the doctoral students with the exception of the advisor's help in defining the dissertation topic (see Table 9).

**Thesis Quality**

The theses completed in the research supervisory system were evaluated higher overall than the theses not completed in the system by four out of five professors, all of them involved on the thesis committees of the five master's theses completed in the research supervisory system. The one exception was a professor who evaluated one thesis completed in the system and one not completed in the system (see Table 10). The quality evaluators were five of the 18 faculty who participated on thesis committees in 1986 in the Psychology Department. (The evaluations in Table 10 were based on five master's theses completed in the research supervisory system and eight master's theses completed outside of the system.)
The Dean of The Graduate College assigned an evaluation with a mean score of 2.90 to the same five master's theses completed in the research supervisory system that were evaluated by the faculty, and she assigned an evaluation with a mean of 2.98 to a total of 22 research efforts completed in the Psychology Department but not in the research supervisory system, including those evaluated by the faculty (77% master's theses, 14% dissertations, and 9% specialist projects). She also assigned an evaluation with a mean score of 3.21 to the 106 research efforts completed in departments other than the Psychology Department (51% doctoral dissertations, 40% master's theses, and 9% specialist projects) (see Table 11).

Table 10
Faculty's Mean Evaluations of Theses Completed in the Research Supervisory System and Theses Not Completed in the System

<table>
<thead>
<tr>
<th>Faculty No.</th>
<th>Mean Evaluation of Theses Completed in the System</th>
<th>Mean Evaluation of Theses Completed in Psychology, but not in the System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.38 (n = 4)</td>
<td>2.5 (n = 2)</td>
</tr>
<tr>
<td>2</td>
<td>3.7 (n = 3)</td>
<td>3.5 (n = 3)</td>
</tr>
<tr>
<td>3</td>
<td>3.25 (n = 2)</td>
<td>2.0 (n = 5)</td>
</tr>
<tr>
<td>4</td>
<td>3.5 (n = 1)</td>
<td>3.0 (n = 3)</td>
</tr>
<tr>
<td>5</td>
<td>3.5 (n = 1)</td>
<td>3.5 (n = 1)</td>
</tr>
</tbody>
</table>

Legend. n = number of theses evaluated by the same professor.
The Dean assigned an evaluation with a mean score of 3.5 to the three dissertations completed in the Psychology Department and an evaluation with a mean score of 3.32 to the 54 completed in departments other than psychology. She assigned evaluations with mean scores of 2.88 and 2.90 to the 22 master's theses completed in the Psychology Department and those completed in the supervisory system and an evaluation with a mean score of 3.29 to the 42 master's theses completed in departments other than psychology. The Dean assigned an evaluation with a mean score of 3.0 to the two specialists projects completed in the Psychology Department and an evaluation with a mean score of 3.24 to the 54 completed in departments other than psychology.
score of 2.85 to the 10 completed outside outside this department (see Table 11). (No dissertation or specialist project were completed in the supervisory system during this study.)
CHAPTER IV

CONCLUSIONS AND DISCUSSION

Within-Group Comparisons

When the no added incentive and the letter of recommendation as the only added incentive were compared with the added incentive of gaining or losing academic credits, all the students appeared to be helped under standard circumstances and some of the students under special circumstances. The performance of two out of four students under special circumstances increased with the bi-weekly credit contingency as opposed to the semester contingency.

After exposure to the semester and bi-weekly credit contingencies, the performance of some students under subsequent letter conditions remained high. Three students indicated that working hard under the initial credit contingency caused them to arrange contingencies other than the ones established in the supervisory system (e.g., some students scheduled weekly meetings with the subjects in their experiments or their managers on the job). These additional contingencies might have maintained a high performance when the credit contingencies were removed.

Special circumstances might be debilitating when compared with otherwise amenable conditions. Contact with the university environment and other useful resources for the thesis process (e.g., libraries, computer services, and faculty advising) was more difficult to maintain under special circumstances (e.g., working...
full-time). In addition, special circumstances involved behaviors that produced more immediate, probable, and sizable outcomes (e.g., increments in salary and promotions or simply keeping their jobs) than those produced by research behaviors. On the other hand, two out six students who did poorly under the special circumstances also did poorly under the standard conditions. In addition, four out of six of these students had entry GPAs lower than 2.96, which could explain in part why they ended up in the special circumstances. (The entry GPAs refer to the cumulative GPAs obtained during the last two years of high school or previous institution of higher education.) They might be unusually susceptible to having their performance disrupted by such special circumstances.

Graduation deadlines seemed to increase the performance of four out of six students under standard circumstances, but they did not seem to influence the performance of four out of five master's students with special circumstances. These four students attended the graduation ceremony without having completed their theses. Only one of them completed her thesis within the following year.

The major reason given for discontinuing participation in the supervisory system was that the students were unable to invest as much time as was required in the system at the moment of withdrawal. (Only one student reported dropping out as a result of the implementation of the semester contingency.) However, the completion of a thesis or a dissertation requires intense and constant work, and not having enough time is the main rationale underlying procrastination and the ABT phenomenon.
The dependent variable is a complex one, consisting of points allocated for a wide variety of different tasks (e.g., writing, reading, and collecting data), and the relative frequency of those tasks varied as the student passed through the different phases of the research and writing process. Thus it is reasonable to raise the question as to whether there is a confounding of changes in the experimental conditions. Such a confounding does not seem reasonable for three reasons. (1) These tasks were held together by one common metric, an estimate of the time required for the completion of each task, with one point roughly equating one hour of work, though physical and psychological effort were not considered. Therefore, this metric (amount of time) was the constant dependent variable across experimental conditions. (2) There appears to have been no systematic confounding of tasks across experimental conditions because all of the different phases of research were represented in each of the different experimental conditions. (3) In many instances, the changes in the experimental conditions occurred within a single phase of research within a single semester. Furthermore, Sidman (1960) uses the somewhat misleading terminology "systematic replication" to describe this sort of variation in the nature of the dependent variable and setting parameters. He considers such variation desirable in that it strengthens the generality of findings, when the results show that the independent variable has essentially the same effects, in spite of that variation in the dependent variable or setting factors.
Another reasonable question concerns the nature of the supervision. Perhaps the nature of the supervision is irrelevant. Perhaps a warm, empathetic, holding approach, or any approach would be equally effective. However, the within-subject data clearly show that supervision, per se, is not the critical effective variable. If simply meeting regularly with supervisees, showing concern for their progress or lack of it, and discussing the research were all that is required, then there would have been a high percentage of task completion throughout the study. The data, show that specific features of supervision are important to ensure that the work gets done (e.g., the monitoring of performance and the delivery of incentives such as points toward the evaluation of Credit dependent on the completion of tasks).

The fact that some of the within-group comparisons did not produce powerful effects should be understood within the context of the structure existing in the supervisory system but usually absent in traditional supervision of research, for example, the weekly task specification, the weekly feedback with points, the weekly meetings with the supervisors, the bi-weekly meetings with the faculty advisor, and the semester oral research presentations. In addition to these components, the specific variables manipulated were letters of recommendation and credit contingencies. In other words, the between-group comparisons involving the high degree of structure of the research supervisory system was compared with the much lower amount of structure in more traditional systems.
Between-Group Comparisons

In comparison with students from the University not in the research supervisory system, the students in the research supervisory system completed more tasks toward their theses and dissertations, in spite of the fact that their mean cumulative GPA was lower, the credit hours taken simultaneously with the thesis work were higher, and the number of months spent in their programs was lower. It is possible that the students in the research supervisory system made more progress because they received more supervision from their advisors than the students not in the system. In addition, 4 out of 19 faculty rated the theses and dissertations completed in the supervisory system higher than those not completed in the system. The Dean, however, assigned similar scores to both groups of completed master's theses.

A selection bias may have resulted from the fact that only 6.9% of the initial sample of 930 students not participating in the supervisory system answered the survey. There may have been several reasons for the low percentage of replies, though it seems to be that this percentage is typical of those found with such studies. (a) Those students who were in the program for several semesters might have forgotten details of their academic and work histories. (b) The students might not have wanted the experimenter's viewing of their academic records. (c) Those classified as active students in the university records might have not been active students (taken at least one course during the academic year 1985-86). Indeed, nine
surveys were returned by students who were not enrolled in the University or who had graduated more than a year previously. (d) The students might have been too busy completing their course work during the last month of the semester, when the surveys were mailed. (e) The students who answered the survey might have been a selective group of sufficiently effective time managers that they did not procrastinate and did reply to the survey.

The reduced number of respondents to the survey did not allow the establishment of comparisons between students with common demographic and academic characteristics. However, based on the differences between the comparison group (Group 1) and the research supervisory group, one might expect that the comparison group would have performed larger quantities of research tasks than the supervisory group. (The students in the comparison group had been in the graduate program longer, had obtained a higher GPA, and had taken fewer credit hours at the time they enrolled for thesis or dissertation credits.) The fact that the students not in the research supervisory system reported much less supervision of their research efforts may account for their lower rate of progress.

Does the research supervisory system produce an increase in speed at the expense of a decrease in quality? The data suggest not. According to the faculty sponsors' and the Dean's evaluations, the quality of the MA theses from the system were at least equal to the quality of the MA theses in psychology of students not in the system.

The initial objective of the selection of the comparison group was to identify a group of students who presented common demographic
and academic characteristic. As a result, only active students (students enrolled in the University at the time of the study) were considered in the original population. Therefore, data on attrition rates and delays to degrees were not possible to get from this sample. Instead, a study based on a population of graduates could address those issues.

Another initial objective of the selection of a comparison group was to establish differences in relation to thesis progress and supervision across disciplines. Unfortunately, the reduced number of responses per discipline did not allow this.

Concerning the thesis evaluations by the faculty and the Dean, such a set of evaluations might differ with different evaluators as a function of differing values. It might be that the structure of the supervisory system with the requirement that the students interact with the sponsors resulted in more interaction with the committee; and the resultant development of their theses might have been more in keeping with the values of the committee members than was the case with the students not participating in the supervisory system. In other words, it is possible that different results might have been obtained with the evaluations by faculty who have not been involved with these theses. Of course, it is also possible that the increased interaction with all of the committee members would result in an improvement quality of the theses as judged by independent evaluators trained in psychology.
Suggestions for Improving Research Supervisory Systems

The suggestions included are based on answers to the social validation questionnaire and periodic feedback from the students and the main faculty advisor of the supervisory system.

Prerequisites

Students in the research supervisory system might be required to take research methodology and statistical courses before or during their first semester in the system. Moreover, those with deficiencies in writing, should be required to engage in remedial writing activities from their first semester in the system and continue in such activities for several semesters until their writing improves to an adequate level. In addition to adequate research methodology, statistics, and writing skills, the supervisors should be required to have completed a thesis. This would ensure that only doctoral students be supervisors, though this requirement is not always feasible.

Special Contingencies

The performance of some students was the same under both credit contingencies; others performed higher under the more demanding contingency (bi-weekly). Therefore, more demanding contingencies could be implemented conditional on the students' initial performance. Students who demonstrated that they worked well under
less demanding contingencies would be allowed to do so. (However, there was no complaint about the contingencies.)

The penalty for turning in the research contracts late still allowed procrastination by some students in the system (e.g., losing one point for each day of delay, up to a maximum of seven points). As a result, the probabilities of obtaining the grade of no credit increased for some students, and the feedback process slowed down. A stronger penalty (e.g., losing five points per day of delay up to a maximum of three days) might reduce this problem, though no evidence was obtained.

The performance of the supervisors was not adequately monitored; the monitoring of the supervisors was a complex and time-consuming task. Assessment procedures for supervisory activities should be implemented to evaluate the quality of supervision and editing of written products.

Tasks not directly related to the completion of the thesis or dissertation might have discouraged some students from participation, although there is no evidence that this was the case. Probably, the most demanding task of this sort might have been acting as the supervisor of other students. This might have demanded additional work above and beyond that needed to complete a thesis. Independent requirements for being a student and for being a supervisor in the system could be considered in future supervisory systems.

Doctoral programs in psychology have a teaching requirement based on the assumption that a high percentage of graduates will teach in universities. However, university teaching often involves
the supervision of theses and dissertations; and unfortunately, research supervision training is absent in most programs. Just as it is not assumed that one learns to teach by taking courses, it should not be assumed that one learns research supervision by doing a dissertation.

Thesis Quality

With the exception of the research presentation, the grade of the students in the current system was determined by measures of quantity (e.g., number of pages written and number of articles read). The system would benefit by adding quality evaluations of major thesis accomplishments (e.g., thesis proposal, final data display, and the overall thesis). These quality evaluations could help the students prevent major errors before it would be too late to implement changes (e.g., detecting errors in the data recording procedures that may affect the validity of the study before the data collection phase.)

Materials

The system should allow periodic readjustments of the tasks specified in the research contracts, because the tasks are sequential and interdependent across contracts. When a major task was not completed, (e.g., finish collecting data), the students often had problems completing forthcoming contracts.
The feedback form should be modified so each student could see the semester's history of cumulative percentages rather than the history of weekly percentages because the credit/no-credit contingencies only involve cumulative percentages. In addition, the feedback form should include the number of extra points needed to achieve the passing criteria whenever the weekly percentage falls below 85%.

Procedures

At the coordination meetings conducted during the first week of each semester, the new students were overwhelmed with the many policies and procedures reviewed, whereas the experienced students were exposed to the same information presented in the coordination meetings of previous semesters. The coordination meetings could be improved by having separate induction meetings with the new students before the group coordination meeting and by eliminating redundant information from previous semesters.

Some procedures were difficult to implement (e.g., the implementation of the recurring-task agenda and the assignment of points per task). The system coordinator should observe the supervisory meetings periodically and give feedback to the student and the supervisor at the end of the meeting concerning the implementation of the rules and procedures of the system.

The task of filling out a self-evaluation form that requires the students listening to a tape of their own presentations should be added to the research contracts. This task may help them improve
their English, presentation skills, and fluency of talking about their thesis topics. In addition, the system's coordinator could keep track of the content of the presentations by reviewing the students' transparencies and implementing a point-loss contingency for presenting redundant information across semesters.

The students and supervisors were required to give feedback to each other using the self-development interview forms (Appendix L), and designing a behavior modification program to improve the weakest feature of their relationship. This procedure was implemented to improve the supervisor-supervisee interpersonal and professional relations. Although all the students received and gave feedback, the follow-up programs were not implemented. A better monitoring of these programs through the weekly contracts could be developed by specifying follow-up tasks and their proofs (e.g., data recording forms and graphs of the behavior in question).

Cost-Benefit Analysis

Implementation of this research supervisory system required approximately 5 to 10 hours per week of coordination time, involving data processing, distribution of feedback and materials, ongoing system evaluation, and ongoing problem-solving. The supervisors spent approximately one hour per week per student, and a few extra hours per semester editing their supervisees' proposals and thesis drafts. The main faculty advisor of the research supervisory system invested approximately 10 hours a week supervising about six doctoral
dissertations (one hour per week for each dissertation) and 14 master's theses (half an hour every other week for each master's thesis). The materials were inexpensive (from $2 to $5); they were covered by students' fees.

All members benefited from their participation in the supervisory system in several ways. In addition to training in systems analysis, the systems' coordinators (the experimenter and a research assistant) were completing academic requirements: the experimenter was conducting her dissertation, and the research assistant was completing an undergraduate requirement for a research practicum. Similarly, some supervisors were completing research credits and others satisfying the supervision requirements of a behavioral systems analysis course. In addition, the supervisors received training in research supervision and behavioral contracting for monitoring research behaviors. Each also had the opportunity of supervising research relevant to his or her own thesis or dissertation and becoming the second authors in the case of publication of their supervisees' theses.

However, if every faculty member supervised six doctoral students, and in exchange, each doctoral student supervised three master's theses, 24 research projects would be conducted simultaneously.

Publication rate based on the publication of theses and dissertations could also be increased by implementing a research supervisory system. For the academic year 1985-86, theses and dissertations produced 14% of the research publications of the
Psychology Department at Western Michigan University. (These data were extracted from the Psychology Department's WMU Annual Report [1986].) If each faculty completed 12 theses and dissertations (half of the theses supervised), and published 25% of those (three theses or dissertations), the rate of research publications of the Department would increase 18 times.

The number of theses completed and the number of students graduated may be appropriate measures of faculty effectiveness. Unfortunately, faculty effectiveness is often assessed by indicators not necessarily associated with the success of their students, for instance, the number of individual publications, number of courses taught, and/or personal research conducted.

Philosophical Objections

The feature of graduate education considered typically most valuable is independent intellectual effort in the pursuit of knowledge and scholarly inquiry. This may underlie the most common objection to research supervisory systems; providing structure and incentives for research completion clearly runs counter to traditional attitudes and values of higher education (Wilson, 1965). Such pursuit of knowledge and scholarly inquiry is basically an argument for internal motivation and implies the rejection of artificial rewards (e.g., points, letters of recommendation, and academic credit) to motivate the students. It has been asserted that "Most of the activities of most professionals and scientists are
the result of artificial motivation—praise, recognition, awards, pay, promotions, tenure" (Malott, 1981, p. 2). Artificial rewards control many professional behaviors and probably the thesis or dissertation work is one of the most unstructured environments encountered in educational careers.

Another common argument for resisting the implementation of supervisory systems may be that people do not like to be monitored. However, the social validation results indicated that nearly all of the students appreciated the structure offered to them and wished to continue in the system.

It is common to hear that students with high GPAs do not need structure to complete their theses and dissertations. However, in this study students with GPAs of 3.5 or higher performed 31% more tasks under credit contingencies than under less demanding contingencies, such as those involving letters of recommendation. In addition, the evaluation of students with high GPAs was that they appreciated the supervisory system. (All the students in the system appreciated the structure.) This supports Zoia's conclusions (1981) that students with high GPAs need supervision to complete their research projects.

One could argue that doing the thesis concurrently with the course work would interfere with the progress in course work, and that is why the GPAs of the students in the supervisory system were lower. However, the students in the supervisory system did not take more than the standard number of credit hours typically recommended (i.e., nine credit hours including research credits). Furthermore,
in those semesters when the students did not work on their theses, their GPAs were not greatly improved.

Another objection may be that only those who do manage to graduate without the benefit of the supervisory system deserve the graduate degrees, and that thesis completion constitutes an effective selection criterion of the best professionals.

However, the time, effort and money invested by those students who fail to get their degree should be considered. As indicated in the introduction, completing all the academic requirements except the thesis or dissertation represents the most expensive instance of attrition. Not only the high costs, but also the loss of professional opportunities are undesirable outcomes of this problem. Many professionals are hired based on credentials, educational degrees among them. For instance, most teaching jobs in institutions of higher education require a PhD degree, and ABT candidates might not be considered for those jobs. In addition, the high number of ABTs deprives the community of the considerable benefits of having the increased number of professionals with advanced graduate degrees. For instance, an ABT psychologist might not be able to help the community in a position were a degree is required.

As explained above, the problem of procrastination of long-term projects is not a problem specifically of potentially poor professionals. Even students with GPAs of 3.5 or above might have problems completing their theses and dissertations as it was the case of students involved in the comparison group. Furthermore, most
professionals, especially at the master's level, might never be involved in the completion of such long-term tasks with such poorly defined time lines for controlling sub-goals of the tasks.

The number of professionals produced by institutions of graduate education should be a criterion for assessing their effectiveness. Unfortunately, this has not been the case; instead, the effectiveness of graduate institutions has been evaluated by variables such as enrollment, prestige, and the number and qualifications of faculty (Jones, Lindzey, & Coggeshall, 1982). However, one of the ultimate objectives of institutions of higher education should be the graduation of the students accepted by those institutions. Therefore, it is in part the responsibility of the universities and graduate advisors to graduate those students who are admitted.

Addressing the "All But Thesis" Phenomenon and Related Problems

Rather than directly assessing the magnitude of the ABT phenomenon, the present study was an attempt to reduce the ABT problem by implementing a research supervisory system to help students complete their theses and dissertations. Given the relations between the ABT problem and other related problems (i.e., attrition, delays in obtaining degrees, and delays in the completion of theses and dissertations), the proposed solution might also reduce these other problems of higher education.

Research supervisory systems might also greatly increase the number of students each faculty member graduates. Assuming that the
students graduate when they complete their theses or dissertations, each faculty implementation of a supervisory systems (involving approximately 18 MA and 6 PhD students) could result in the graduation of an average of two doctoral students and nine master's students per year. That would be far superior to the current rate for faculty members in the Psychology Department at Western Michigan University, where 89% of the faculty supervised students who completed one or no doctoral dissertations in the academic year 1985-1986; and in the same year, 61% supervised the completion of one or no master's thesis. This must be a serious problem university-wide considering the fact that the Psychology Department generates the greatest number of theses and dissertations in this university. (These data were extracted from the Psychology Department's WMU Annual Report [1986].)

The research supervisory systems might also reduce the delays in the completion of graduate programs. Approximately 30% of the active students in the master's program had been in the program for an average of 4.3 years; and 24% of the doctoral students had been in the program for an average of 7.8 years. (These data were based on the entry dates of a total of 323 master's active students and 164 active doctoral students in psychology at Western Michigan University.) The lack of supervision for the completion of theses and dissertations might be a major cause of these delays. Though, as indicated in the introduction, other variables might have also
influenced such delays (e.g., the lack of basic skills or financial problems).

The research supervisory system might have a greater impact on reducing delays in the completion of theses and dissertations. If master's students complete 100% of the tasks specified in their research contracts, they would be expected to finish their master's theses in three 15-week semesters, and doctoral students in six. Indeed, the five students who completed their master's theses in the supervisory system invested an average total of only 3.3 semesters in conducting their theses.

In contrast, of those who did not participate in the system, 39% of the master's students and 14% of the doctoral students had not defined a thesis or dissertation topic, in spite of the fact that they had been in their programs for longer periods of time (master's students for 28 months and doctoral students 45).

This relates to the fact that most students who complete their theses were unsatisfied with the advisors' and sponsors' supervision. For instance, Berelson (1960) found that 50% of the doctoral recipients (out of a total of 3,834) were disappointed with the lack of amount and quality of assistance and guidance they encountered in their relationships with their advisors and sponsors. Heiss (1970) reported that approximately 67% students (out a total of 3,153) received help from the sponsors to define the dissertation topic, 56% received some assistance in writing the research design, and 62% received assistance in writing the dissertation. Eighty percent of
the degree recipients in each of these studies reported that their advisors did not schedule regular thesis meetings.

Students might be able to complete their degrees more quickly if they start their theses when they first start taking courses. Many features of doing research require time lapses that cannot be accelerated by the students concentrating full-time on their theses and dissertations, for example, waiting for committee approval, requesting books or articles through interlibrary loans, or getting approval for the research setting. Furthermore, the research setting might have a specific time frame independent of the time the student has available. Research supervisory systems might help the students start earlier and maintain high performance during their thesis process.

Suggestions for Future Research

The following research should be further developed. First, more studies need to be conducted to determine the magnitude of the ABT problem. These studies should incorporate accurate measures involving review and verification of academic records. Past ABT studies have been based on either surveys or the review of universities records (Berelson, 1960; Jacks et al., 1983; Knox, 1970; Lunneborg & Lunneborg, 1973; Naylor & Sanford, 1982; Sells, 1975; Valarino, 1986; Wright, 1964). However, as indicated in the introduction of this paper, each procedure by itself presents some limitations. On one hand, survey data might not correspond with the reality of the circumstances; and, on the other hand, the university
records may not be accurate. Further research should combine both procedures.

The effects of supervision on time to degrees, time to complete research projects, and rate of theses completed should be further studied. Comparisons of thesis progress among students who receive different levels of supervision should be studied. However, practical, legal, and ethical limitations should be considered in the selection of comparable groups. An alternative for the selection of the groups would have been the random assignment of half of the graduate students to the research supervisory system. Another strategy would have been the selection of students who have common characteristics with the characteristics of the students in the supervisory system (e.g., cumulative GPAs or GREs). However, their consent to participate in such an experiment would have also resulted in a biased sample.

An alternative approach for comparing the amount of supervision and thesis or dissertation progress across students and disciplines could be the use of larger samples of students so as to implement statistical comparisons by multivariate analyses involving several dependent variables (e.g., time to degree, number of research tasks completed, and attrition rates) and independent variables (e.g., number of meetings with supervisors, and delivery of consequences depending on performance). However, in order to do that the University would have to implement program evaluation strategies exempt for human subjects procedures. The limitations for obtaining
the relevant information do not allow individual researchers to conduct this type of study.

Another approach would be to completely abandon the between-group design and adopt within-subjects design strategies, where each individual is treated as a case study. Information on thesis progress, supervision, attrition, and delays should be gotten from surveys or from interviews with the students in question, their advisors, and any other significant participants. Whenever inconsistencies of information are found, the student, or other relevant persons should be asked for clarifications.

Comparisons between the quality of the theses completed in supervisory systems and theses not completed in such systems should be further investigated. A major difficulty of such studies consists of not having an universal agreement on the criteria of a good thesis. An initial step could be specifying the criteria that characterize a high-quality thesis that would involve the development of a quality check-list validated by experts on thesis supervision. Then evaluators, unrelated to the students being evaluated, should be trained to assess quality. In addition, future studies should involve the application of research supervisory systems to different populations. An interesting population would be students under special circumstances, such as extended illness, completion of course work prior to the completion of the theses or dissertations, living out-of-town, engaging in full-time jobs. Single-case research involving this population may allow the determination of effective contingencies.
Another interesting population would be faculty members. A similar research supervisory system could be implemented to increase the research and writing productivity of faculty professors. This would be especially useful considering that the publication of most faculty members consists only of their own dissertation (Centra, 1979), which may be explained by the fact that their teaching activities (e.g., lecturing, evaluating papers, and preparing tests) are easier and produce more immediate deadlines than those involved in long-term writing and research projects.

A research supervisory system could also be implemented in environments that lack the possibility of using doctoral or advanced master's students as research supervisors. An alternative application could involve having a full-time experienced thesis supervisor monitor and supervise the theses and dissertations conducted in a specific setting by using research contracts and materials similar to the ones used in this study.

The application of behavioral supervisory systems of research to scholarship and research grant institutions might reduce the amount of wasted money payed for research that never gets completed. Zoia (1981) demonstrated that $11,000.00 was paid every year to students who never completed their projects in a prestigious scholarship program. He suggested investing part of this money for funding effective supervisory systems that would include task specification, weekly subgoals or deadlines, observation of completed work through weekly meetings, weekly feedback, and added incentives.
Appendix A

Subjects Approval Forms
Dear student:

I am doing my dissertation on a system for the supervision of theses and dissertations in the Psychology Department of Western Michigan University. I chose this topic because a high percentage of graduate students never manage to complete their theses or dissertations or spend too much time on these projects.

Some studies indicate that students in structured supervisory systems increase the percentage of thesis tasks completed. The main components of these systems are weekly meetings with a research supervisor, detailed specification of tasks, feedback, and recommendation letters. I intend to provide such structure for the students participating in this study. No risk is involved for participants.

I will compare the effectiveness of this research supervisory system with traditional supervisory systems in several departments at Western Michigan University. I will compare the amount and quality of the thesis work completed by different groups. I will need to review your data available in the university files (e.g., graduate programs, GRE scores, cumulative GPA, etc.) in order to determine the compatibility of the groups being analyzed. This is basically a group study. Most of the data obtained will be averaged. However, some individual data concerning weekly task completion in the research supervisory system may be presented.

I assure absolute confidentiality and privacy of your data in this study and in possible presentations or publications. You can withdraw from this research at any time. However, the data collected prior to your withdrawal will be used.

I understand the procedures and implications of my involvement in this research, and I agree to participate.

Student's signature: __________________________
Dear Graduate Student:

A study is being conducted to determine the characteristics of effective supervisory systems for helping students to complete their theses in the graduate school at Western Michigan University. (Note: In this survey the term thesis also implies dissertations and special research projects required for graduation.)

In order to do this study, we need specific information from you. We assure complete confidentiality of the information reported. Please fill out this questionnaire and return it in the enclosed envelope.

Sincerely,

Dr. Laurel Grotzinger, Ph.D
(Dean of the Graduate College)

Dr. Dale Brethower, Ph.D
(Research Advisor)

Maria E. Garcia, M.A.
(Researcher)
We would like to obtain your permission to use information available in the university records. We assure complete confidentiality of the data. No names will be identified and the data will be computed in group averages. We are interested in the following data: entry GPA, cumulative GPA, cumulative hours earned, hours earned per semester, place where previous degree was obtained, citizenship, race, sex, GRE and entrance test scores.

I give my permission for the above records to be released in order to assist Maria Emma Garcia in her research for a PhD. I authorize release of this information to Maria Emma Garcia. I do not desire the release of this information to me.

(Signature)
Dear Faculty Member:

Maria Emma Garcia is conducting a dissertation that consists of an evaluation of the effectiveness of a research supervisory system implemented with a group of graduate students in the Psychology Department.

We are interested in comparing the quality of the theses completed by students in this research supervisory system with those completed by students outside that system.

We need evaluations by members of the thesis committees. We would appreciate your completing an evaluation form. We guarantee complete confidentiality of your evaluation. Maria Emma Garcia is the only person who will have access to these evaluations. Neither students nor faculty will know the results.

Sincerely,

David Lyon, Ph.D
(Chairman of the Psychology Department)

Dale Brethower, Ph.D
(Research Advisor)

Maria Emma Garcia, M.A.
(Researcher)
Dr. DAVID LYON
CHAIRMAN OF THE PSYCHOLOGY DEPARTMENT

Dear Graduate Student:

Maria Emma Garcia is conducting a dissertation that consists of an evaluation of the effectiveness of a behavioral research supervisory system implemented with a group of graduate students in the Psychology Department.

We are interested in comparing the quality of the theses completed by students in the research supervisory system with those completed by students outside that system.

We would like to obtain your permission to see the evaluation of your thesis from the members of your committee. We guarantee complete confidentiality of that information. Maria Emma Garcia is the only one who will have access to that information, no other student or faculty member will be able to see it.

I authorize release of this information to Maria Emma Garcia.

(Signature)
Appendix B

Example of a Research Contract
# RESEARCH CONTRACT: GENERATING PHASE

**Week 8-7 = 2/23**

<table>
<thead>
<tr>
<th>TASKS</th>
<th>PROFDB</th>
<th>POS.</th>
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<td>- Have a meeting with your research supervisor before the Monday</td>
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<td>when you turn in this contract.</td>
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<td>- If applicable, have a meeting with your advisor.</td>
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<td>all the topic sentences in red. The topic sentence in the first</td>
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<td>sentence in each paragraph. It summarizes the content of</td>
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<td>the paragraph. If irrelevant information was added, or crucial</td>
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<td>information was absent or unclear, specify these in the copy.</td>
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<td>- Edit the first draft of the introduction (Step 2). Underline</td>
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<td>the verb of each sentence in blue. Use past tense. Change</td>
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<td>inappropriate verbs in your printed copy.</td>
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<td>- Edit the first draft of the introduction (Step 3). Circle</td>
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<td>connectors between paragraphs. Add or remove connectors when</td>
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<td>necessary.</td>
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<td>- Edit the first draft of the Introduction (Step 4). Circle</td>
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<td>any passive voice in red and change it to active voice in your</td>
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<td>printed copy.</td>
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<td>- Edit the first draft of the Introduction (Step 5). Circle all</td>
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<tr>
<td>the weak subjects in the text (e.g., it and there), and replace</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>them with strong subjects (e.g., the student).</td>
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</tr>
<tr>
<td>- Write the second draft of the introduction. Make the corrections</td>
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<tr>
<td>indicated in the first draft. Paragraphs should contain appropriate</td>
<td></td>
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<tr>
<td>topic sentences and connectors. Sentences should have appropriate</td>
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<tr>
<td>subjects and verb tenses.</td>
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<tr>
<td>- Locating references (Steps 12, 13, and 14). Find actual articles</td>
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<td>4</td>
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<tr>
<td>at Valdo library, other libraries on campus, or their universities</td>
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<tr>
<td>through the inter-library loan service. Track the references of the</td>
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<tr>
<td>best articles found.</td>
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<tr>
<td>- Get approval for conducting your thesis in the tentative setting.</td>
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<td>.25</td>
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<tr>
<td>Describe the preliminary plans for the pilot study to those</td>
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<tr>
<td>responsible for the setting.</td>
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<tr>
<td>- Recruit the subjects for your pilot study. You should begin the</td>
<td></td>
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<td>1</td>
<td></td>
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<tr>
<td>pilot study next week.</td>
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</tr>
<tr>
<td>- Have the &quot;points possible&quot; column of the following week's contract</td>
<td></td>
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<td>.5</td>
<td></td>
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<tr>
<td>filled out prior to meeting with your research supervisor (minimum</td>
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<tr>
<td>points = 13).</td>
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</table>

**Grand Total:**
Appendix C

Literature Review Forms
Literature Review Form (Experimental Article)

Date: ___________________

Supervisor's signature: ______

Title: _____________________________________________________

___________________________________________________________

Author(s): ________________________________________________

Journal: ___________________ Year _______ Vol. ______ pp. ______

Area or problem:

Research question:

Subjects, setting, and instruments:

Dependent variables (specification, observation, reliability):

Independent variables (specification, observation, reliability):

Interesting features or procedures:

Experimental design (how the IVs affect the DVs):

Significance for your research:

Weakness of article:

Conclusions:

Possible references:

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Literature Review Form (Review Article or Chapter)

Date: __________________________

Supervisor's signature: __________

Title: _______________________________________________________

____________________________________________________________

Author(s): __________________________________________________

Journal: _______________ Year _____ Vol. _____ pp. ___________

Based on this article, write one or two paragraphs you might include in your introduction section.

Possible references:
Appendix D

Test on the Procedures of the Research Supervisory System
Test on Procedures of the Research Supervisory System

1) For some powerful reason you cannot attend the meeting with your supervisor. You try to re-schedule that meeting but your supervisor cannot meet with you any other day. Therefore, you do not have a meeting that week.
   a) You lose 1 point for not attending the meeting
   b) You do not lose points because your supervisor could not make it
   c) You lose 5 points for not attending the meeting.

2) If your advisor fails to meet with you during the week scheduled,
   a) you do not lose any points
   b) you lose 1 point
   c) you lose 5 points

3) There is a task specified in the contract that you cannot complete this week because you are not ready for that task yet. You still have to finish some pre-requisite task before.
   a) You write non-applicable and ignore that task
   b) You re-schedule that task for a future week and do not lose points
   c) You lose the points specified for that task.

4) During the week you have difficulties completing a task. You bring to the supervisory meeting evidence that demonstrate that you invested some time in the task but you really did not accomplish it. In that case,
   a) you get points for that task
   b) you do not get points
   c) you will get partial points in spite of your evidence not being the one you contracted for

5) During Weeks 5 to 8 the credit/no-credit contingency is not in effect. Your cumulative percentage up to Week 4 was 85%. In Week 5, you got 0%. In that case, your cumulative percentage
   a) decreases
   b) increases
   c) remains 85%
6) Your cumulative percentage in Week 3 is 84% and your cumulative percentage in Week 4 is 83%. In that case,

   a) you try to improve your cumulative percentage in Week 5
   b) you are not able to improve your cumulative percentage in Week 5 because the credit/no-credit contingency is not in effect
   c) you will not able to continue in the system this semester and you will receive no credit.

7) In Week 10 you did not have many tasks to do. So you contracted for only 7.5 points and earned 7.5 points. Your weekly percentage is

   a) 100%
   b) 50%
   c) 75%

8) You contract for writing the introduction section for a minimum of 6 points (6 double-space typed pages). But you fail to show evidence (the 6 pages written). In that case,

   a) you lose 1 point for incomplete evidence
   b) you lose 6 points
   c) you get points because you wrote the introduction but you just forgot to show evidence.

9) Two days before your presentation, you find out that you cannot make it that day. You re-schedule the presentation for another week. The maximum points you could get are (is)

   a) 20
   b) 15
   c) 0

10) You turn in your contract on Wednesday at 3 pm. after the Monday deadline. In that case, you lose

    a) 2 points
    b) 3 points
    c) no points

11) When you turn in your research contract late, you should leave it in

    a) the assistant coordinator's office
    b) the Center of Self-Management
    c) the coordinator's mailbox
Feedback Form  
Behavioral Research Supervisory System

<table>
<thead>
<tr>
<th>Students' Names</th>
<th>Weekly Percentages</th>
<th>Cumulative Percentages</th>
<th>Presentations' Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Group Averages

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Appendix F

Model of the Letter of Recommendation
Dear Colleagues:

RE: The application of (Your name)

In addition to the above considerations, (your name) has participated in the behavioral research supervisory system for (X) semesters. During the first semester, (your name) completed (X)% of the tasks he (she) agreed to complete. The highest performer completed (X)%, the lowest performer completed (X)%. The performance of (your name) ranked in number X for that particular semester.

(Note: This information is specified for each of the semesters you have participated in the system.)

Some additional considerations are ...

Sincerely,

(Professor of Psychology)
Appendix G

Recurring-Task Agenda for Supervisors
<table>
<thead>
<tr>
<th>Recurring-Task Agenda for Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisors: ____________</td>
</tr>
<tr>
<td>Supervisors: ____________</td>
</tr>
</tbody>
</table>

1. Meeting attended
2. Proofs paper clipped and completed
3. Correspondence of "points earned" and "time"
4. Check additions; sub-totals, totals, total time
5. Re-assign old tasks not completed
6. Check "points possible" for next week (minimum=13)
7. Assign new non-recurring tasks
8. Write re-assigned and new NRTs in NRT's agenda
9. Discuss thesis
10. Sign this form in the correct week cell

11.

12.

13.

14.
Appendix H

Survey Used for Between-Group Comparisons
Name: ___________________ Social Security #: ___________________

Age: ___________ Sex: ___________ Race: ______________________

Department: ___________________ Program (master's or doctoral): ______

Name of the program: ___________________________________________________

(If you need more space, write on the back on the page.)

THESIS WORK:

Have you begun to work on your thesis? ___. If not, indicate when you are planning to begin your thesis work. ______. If yes, fill out this section and the following.

Have you defined your thesis topic? ___.

Have you read the main literature related to your thesis? ___. How many articles and chapters have you read? _______. How many books? ______.

Have you written your thesis proposal? ___. Has your graduate committee approved your thesis proposal? ____.

Have you collected data? ____.

Have you begun to write your thesis? ___. How many pages have you written? ____.

SUPERVISION:

Did your advisor or supervisor help you to define the thesis topic? ___.

Does your advisor meet with you regularly to help you concerning your thesis? ___. About how often have you met? ______________.

How often does your advisor specify the thesis tasks you should perform in detail? ______________. How many tasks per meeting? _____.

Does your advisor provide you frequent feedback concerning the progress on your thesis? ____.

How does your advisor provide feedback? For example, comments on draft complete manuscript ___, minor editing of manuscript ___, or extensive editing of manuscript ___, other _____________________.

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Does your advisor provide a motivational or incentive system to help you work on your thesis? ___. Describe: ________________________________

How would you describe your advisor? Highly supportive ___, highly critical ___, both highly critical and highly supportive ___, supportive but not very critical ___, critical but not very supportive ___, or non-directive (provides little guidance) ___.

Do the other members of your committee help you define, design and conduct your thesis? ___. Describe: ______________________________

Have you taken methodology courses that helped you to design your study? ___. How many courses? ___. Were these courses required? ___. Describe the way those courses have helped you. ______________

Was at any time in the preparation of your thesis an unusual event that prolonged the time you invested in your thesis? ___. Describe: ________________________________

Have you changed your area of study since you first entered: ___
Specify: ________________________________
<table>
<thead>
<tr>
<th>Semester</th>
<th>Total # of hours working as a graduate assistant or in outside jobs, separate from your academic work</th>
<th># of credit hours registered for and completed</th>
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<tr>
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<td></td>
<td></td>
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<tr>
<td>Spring 83</td>
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<td>Summer 83</td>
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<td>Fall 83</td>
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<tr>
<td>Winter 86</td>
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<td></td>
</tr>
</tbody>
</table>

List other semesters if applicable:
Appendix I

Thesis-Quality Evaluation Forms
THESIS EVALUATION
(Faculty)

Student name: ____________________ Date: ______ Thesis ___ Dissert. ___
Advisor ____ First Sponsor ____ Second Sponsor ____ Other ______

Compare each of the following aspects of the thesis in question with the other theses you have evaluated in this department. After filling out this evaluation form, put it in the envelope and give it to Arlene Lewis.

Significance of the study:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Literature review:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Method:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Results:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Conclusions:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Discussion:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Writing style:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Organization:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Oral defense:
Top 10% ___ Top 20%-40% ___ Average 50% ___ Low 20%-40% ___ Low 10% ___

Overall grade: A ___ AB ___ B ___ BC ___ C ___ CD ___ D ___ DE ___ E ___

Comments: __________________________________________________________________
<table>
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<tr>
<th>Thesis Evaluation</th>
<th>Excellent</th>
<th>Poor</th>
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<tbody>
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<td>Student name:</td>
<td></td>
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<tr>
<td>Date:</td>
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<tr>
<td>Master's thesis</td>
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<tr>
<td>Doctoral dissertation</td>
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<td>Department:</td>
<td></td>
<td></td>
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<tr>
<td>Significance of the study</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Literature review</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Results</td>
<td>1 2 3 4</td>
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<tr>
<td>Conclusions</td>
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<tr>
<td>Discussions</td>
<td>1 2 3 4</td>
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</tr>
<tr>
<td>Writing style</td>
<td>1 2 3 4</td>
<td></td>
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<tr>
<td>Organization</td>
<td>1 2 3 4</td>
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<tr>
<td>Overall grade:</td>
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<tr>
<td>A ____ AB ____ B ____ BC ____ C ____ CD ____ D ____ DE ____ E ____</td>
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<tr>
<td>Comments:</td>
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Appendix J

Mean of Individual Weekly Percentages
## Mean of Individual Weekly Percentages

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### Mean of Individual Weekly Percentages—Continued

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<th>Student No.</th>
<th>Let. No.</th>
<th>Let. + Sem.</th>
<th>Let. + Let. BW</th>
<th>Let. + No. BW</th>
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<td>--</td>
<td>11</td>
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Legend. N = number of students; Let. = letter condition; Let. + Sem. Cont. = letter and semesterly contingency; Let. + BW Cont. = letter and bi-weekly contingency; No Let. = no letter condition; * = Special circumstances began and maintained during the study; # = Students who withdrew from the system.

Note. The data of three students in the system only for few weeks were not included.
Appendix K

Social Validation Questionnaire
Social Validation

Please, fill out this questionnaire and turn it in with your contract next Monday.

1) Circle the major accomplishments this semester on your thesis or project:

1. Defined thesis topic
2. Read 10 relevant articles or more
3. Got approval from setting
4. Conducted a pilot study
5. Wrote proposal
6. Got approval concerning the protection of human subjects
7. Began collecting data
8. Finished collecting data
9. Wrote first draft of thesis
10. Wrote final draft of thesis
11. Had the final oral examination
12. Turned the thesis into The Graduate College
13. Wrote the publication draft of thesis

2) Rate each of the following items from 1 (excellent) to 4 (poor) and make a comment that justifies your answer.

<table>
<thead>
<tr>
<th>Item</th>
<th>Excellent</th>
<th>Poor</th>
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</thead>
<tbody>
<tr>
<td>2.1) The structure of the meetings with your research supervisor based on the recurring tasks agenda.</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2) The contribution of your research supervisor to your research.</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3) Contribution of your advisor to your research.</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4) The semester's coordination meeting. (This was the initial meeting when materials were given.)</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5) The research contracts.</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.6) The literature review forms.
Comments: ___________________________

2.7) Your research presentation.
Comments: __________________________

2.8) Thesis outline.
Comments: ____________

2.9) Feedback form.
Comments: ___________________________

2.10) If you were a supervisor, evaluate your experience as a supervisor in the system.
Comments: ___________________________

3) Describe what is meant by removing the credit/no-credit contingency?

4) Was your performance affected by removing the contingency? 
   Yes ___ No ___ Why? ___________________________

5) How does your performance in the system this semester differ from your performance last semester?
   It is better _____; It is worst _____; It is about the same _____.

5) What is the most effective variable controlling your weekly research task completion? ________________,__________________________

6) Do you wish to participate in the system next semester?
   Yes ___ No ___ Non Applicable ___

7) Do you wish to continue being a supervisor next semester?
   Yes ___ No ___ Non Applicable ___

8) Other comments: ___________________________

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Appendix L

Self-Development Interview Forms
Supervisee's Self-Development Interview

Evaluate yourself in each of the following categories and base your evaluations on behavioral examples. Then discuss each item with your research supervisor.

<table>
<thead>
<tr>
<th>Item</th>
<th>Excellent</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is reliable. Does what he or she agreed to do.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turns in the tasks on time. Does not miss a deadline.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responds well to positive or negative feedback. Does not lose temper, laugh, get defensive, or put down others in response.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takes initiative. Decides what tasks should be done and does them without waiting for the supervisor's directions.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makes positive comments about the tasks, people, etc.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smiles frequently.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other:

Strongest features:

Weakest features:
Supervisor's Self-Development Interview

Evaluate your supervisor in each of the following categories and base your evaluations on examples. Then discuss each item with your research supervisor.

Always sets deadlines when assigning tasks. Example: ____________________________

Monitors deadlines and progress toward project completion on a regular schedule. Example: ____________________________

Delegates tasks in ways which are cost-effective for the program. Example: ____________________________

Provides feedback in a non-punitive style (i.e., specifies appropriate desired behavior). Example: ____________________________

Is usually available for questions. Example: ____________________________

Holds meetings when scheduled (90% of the time). Example: ____________________________

Other:

Strongest features:

Weakest features:
BIBLIOGRAPHY


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Malott, R. W. (1981). It is morally defensible # 4: To use contingency management with normal adults, or at least graduate students. Notes From a Radical Behaviorist, 2(10), 1-3.


