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AN EXPLORATION OF VARIABLES RELATING TO
HOME-BASED WORK

By

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

1987

ABSTRACT

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The increasing sophistication and availability of personal computers has accelerated popular and professional interest in "telecommuting" and other forms of home-based work. Previous empirical and conceptual efforts have focused on the effect of the home work site on outcome measures. Preliminary results have indicated increased job performance and satisfaction.

Little attention has been directed towards identifying antecedents of home-based work. The present study attempted to identify predictors of the relative amount of time spent at the home work site by university faculty. Previous research and faculty interviews were used to identify variables included as part of a survey. Variables were organized into sets on the basis of a model adapted from expectancy theory. One hundred and eighty-three faculty participated in the survey. Regression analyses indicated that the outcomes associated by faculty with home-based work accounted for a significant amount of variance in a measure of the attractiveness of the home as a work site. Attractiveness, the extent to which faculty were required to monitor the work of others, and the perceived opportunity to work at home contributed to the prediction of relative time at the home work site.

To the memory of William and Gladys Stone,
who first sent me off to school.

ACKNOWLEDGMENTS

Many persons have contributed to the completion of this document. I would first like to thank J. Kevin Ford, the chairperson of my committee, for his useful feedback and occasional prodding. Kevin's willingness to initially critique sub-components of the proposal also helped to speed completion of the project. I would like to thank Neal Schmitt for his early push to "go with something different." Input from Steve Kozlowski and Daniel Ilgen also helped to improve the quality of the study.

I would like to thank my Mother and Father and the other members of my family for their support (moral and financial) during the difficult times. Each day I seem to more fully comprehend the many sacrifices that my parents made, so that I might have the opportunities that they were denied.

I want to thank the "gentlemen" from Friday morning basketball and the Ramon's softball team. They were willing to let an under-talented outsider play.

Last, but certainly not least, I want to thank Robbin, my very best friend. May we both grow old together.

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AN EXPLORATION OF VARIABLES RELATING TO HOME-BASED WORK

Introduction

Recent articles in the popular press have suggested a renewed interest in an old idea: the performance of all or part of one's job from within the home (e.g., Antonoff, 1985; Brophy, 1985; Garr, 1984). Working at home is an idea that predates the Industrial Revolution (Shamir & Salomon, 1985). Recent interest in the concept is largely the result of advances in computer and telecommunications technology. The resulting phenomenon of "telecommuting" involves the use of a computer terminal linked with a central computer through a telephone line to allow the performance of all or part of one's job from within the home (Nilles, 1985; Olson, 1985). The current number of "telecommuters" within the U.S. economy is relatively small (currently numbering around 100,000; Antonoff, 1985). However, the number of persons who will be working at home on an informal basis (not limited to telecommuting) is expected to grow in the future (Olson & Primps, 1984).

The first section of the paper reviews the current research on home-based work. This section is divided into two subsections. One subsection examines the results from empirical studies. The second subsection presents conceptual attempts to examine home-based work. Empirical and conceptual efforts have focused on how working at home affects outcome variables (e.g., job performance).

The second section of the paper introduces the current study. In contrast to the previous research involving the effects of working within the home environment, the present study examines the antecedents of home-based work. A model adapted from Parker and Dyer (1976) is presented. The model illustrates several sets of variables that may predict the amount of time that an individual spends at the home work site. The section concludes with the presentation of the general hypotheses for the study.

Review of Previous Research

Empirical Research

Case Studies

A small number of organizations have conducted pilot studies involving home-based workers (Olson & Primps, 1984). Several pilot programs were described in a recent publication by the National Research Council (NRC, 1985). These studies provide one source for the current state of knowledge regarding the work-at-home phenomenon.

American Express. Raney (1985) described "Project Homebound," a home-based office system designed to allow disabled persons to work for American Express without having to leave home. The pilot project began in 1982 with a sample of 10 disabled persons. These persons had previously received training in word processing. Work performed at home was fed through a telephone line into the company's central computer. Performance was operationalized as the number of lines of text entered and on-line system time. The homeworkers also kept daily logs of their activities. Raney (1985) did not report any of the performance data for the program. American Express, however, was apparently satisfied with the homeworkers' level of performance. Following the pilot study, the employment status of the program's participants was changed from that of "independent contractor" to "full-time employee" (while continuing to work at home).

Blue Cross/Blue Shield of South Carolina. Geisler (1985) discussed the "cottage keyer" program developed by Blue Cross/Blue Shield of South Carolina. The program began with a single individual (the wife of a full-time Blue Cross employee). Fourteen persons were

involved in the program at the time of publication. "Most" of the homeworkers were female and had at least one child living in the home.

The job required the homeworkers to either code or key-in physicians' Blue Shield claims. Homeworkers were required to lease the necessary equipment from the company at a cost to the employee of around \$2,500 per year. The homeworkers were classified as part-time employees, were paid on a piece-rate basis, and received no company benefits other than a company contribution towards a pension fund. In comparison, office employees performing similar duties were classified as full-time workers, were paid on an hourly basis, and received a full benefits package. Despite these differences between the home and office-based employees, the cottage-keyer program had not suffered a single turnover within a five year period (Geisler, 1985).

Geisler reported that 65% of the Blue Shield claims were being keyed and 30% of the claims were being coded by the homeworkers. Thirty percent of the major medical claims were also being keyed and 40% of such claims were coded at home.

Performance of home and office workers was compared using the organization's index of productivity. This index was based on the number of units produced per hours paid. Homeworkers' average productivity was 102% of the company standard while office workers averaged only 76% of the standard. Office workers had a mean error rate of 3.0% compared with 0.5% for the homeworkers.

Performance differences between the home and office workers may have been attributable to a number of factors. Because "cottage keyers" were not monitored as closely as office peers and had greater control over the scheduling of work, Geisler (1985) suggested that the

observed differences in performance were due to a perceived increase in personal control on the part of the cottage keyers. Geisler (1985) also suggested that different schedules of reinforcement and different perceptions of investment may have affected performance. The "schedules of reinforcement" explanation was based on performance being directly linked to rewards within the piece-rate schedule of the cottage keyers. Piece-rate schedules have traditionally resulted in higher rates of responding than non-contingent (e.g., hourly) schedules of reinforcement (Muchinsky, 1983). The "investment" explanation was based on the fact that the cottage keyers were required to lease their machines from the organization. This approach was chosen intentionally by the organization to "ensure employee commitment" to work performance (Geisler, 1985, p. 19-20). It was anticipated that there would be increased pressure on the homeworker to productively utilize the equipment if there was some cost associated with keeping the equipment in the home.

The persons who were offered the opportunity to work at home were regarded by the company as its best workers (Geisler, 1985). Working at home was also perceived to imply some degree of trust in the individual on the part of the organization. The step to working at home was apparently viewed as an advancement in position by the clerical workers in this company (Geisler, 1985).

U.S. Army. McDavid (1985) described a small pilot project with homeworkers conducted in a unionized setting as part of the U.S. Army's Automated Logistics Management Systems Activity (ALMSA). The project received the conditional endorsement of Local 1763 of the National Federation of Federal Employees (NFFE). Local union support

was notable given that the national AFL-CIO has called for an "early ban" on the use of home work-stations (Chamot & Zalusky, 1985).

ALMSA had contracted for twenty hours of computer time per day from an outside supplier. Data indicated that on average only 8 to 10 hours of the contracted time was being utilized. One objective of the home-based work project was to increase the use of contracted computer time without violating the provisions of the union contract.

The pilot program began in 1980 and was conducted using personnel from the Management Information Systems Division (MISD). Voluntary participants included four computer specialists and their immediate supervisor. Participants designated an area within their homes as a "work space." ALMSA provided all necessary equipment (e.g., telephone lines, office furniture, terminals, office supplies). Workers were asked to choose a second or third shift "tour of duty" in the period from 3 PM to 6 AM. The "tour" did not have to consist of eight consecutive hours. The homeworkers were required to work "on-site" (i.e., at the central office) at least every other Friday.

A control system allowed the supervisor to closely monitor the activities of the home-based employees. Commands included in the system allowed the supervisor to observe the on-line activities of the homeworker at any given time (McDavid, 1985). Data was collected concerning the number of hours logged onto the computer (most work was completed "on-line"; McDavid, 1985), the number of "resource units" used, and the names of accessed files. Management was apparently satisfied with the level of control over the home-based workers.

Performance was measured in terms of CPU efficiency rate, computer connect time, and the type of tasks performed. "Efficiency

rate" was operationalized as the number of resource units used divided by the number of hours logged onto the computer. Data for home workers and office workers performing similar job duties was compiled for a 12 month period prior to the start of the pilot study. The pilot project lasted for approximately 18 months.

Baseline (i.e., "in-office") CPU efficiency rate for the group of homeworkers was 40% greater than the CPU efficiency rate for the comparison group. While working at home the efficiency rate for three programmers was 102% greater than the efficiency rate of the comparison group. Average computer connect time for the home-based workers rose by 93%.

ALMSA was able to substantially increase its use of available computer resources without paying for additional computer connect time. As a result of the homemaker project, ALMSA experienced a 64% increase in the mean number of computer resource units used per month (McDavid, 1985). Expenses were also higher because of the need to install additional communications lines into the home and for monthly communications costs (equipment provided for the homeworkers would have been required regardless of the individual's work location; McDavid, 1985).

At the conclusion of the pilot project the participants reportedly preferred to work at home and had come to view the opportunity to do so as a special privilege. (McDavid, 1985). Working at home was also reportedly associated with increased worker morale and received the endorsement of the union local.

An external audit was conducted prior to the extension of the homemaker program. The external audit identified a number of

methodological problems with the pilot study. The problems included: (1) a change in supervisors during the course of the study; (2) attrition of subjects during the course of the study (one of the four homeworkers returned to the on-site location); (3) invalid or "unacceptable" measures of worker productivity; (4) a control system that was still potentially vulnerable to the use of government equipment for personal tasks; and (5) the reported "morale improvements" were not quantified (McDavid, 1985). In view of these problems, the auditor's report concluded that the pilot study could not prove that the increases in productivity were attributable to the work location of the employees and recommended against the continued use of home work-stations within a governmental setting (McDavid, 1985).

Mountain Bell. Mountain Bell Telephone conducted a test program involving home-based workers that lasted from March to November of 1980 (Phelps, 1985). The voluntary participants in the project were "managers" from a technically-oriented training group and had no supervisory responsibilities (Phelps, 1985). The participants wrote instructional material for a training course for computer programmers.

The initial sample for the study consisted of eight persons. Only five managers were still working at home at the conclusion of the study. Each person was required to be accessible during a "core period" of time (8 AM to 5 PM) and was required to work at the regular office site at least one day per week.

Phelps (1985) reported that there was an initial decline in productivity (undefined) among the home-based workers (excluding those who dropped out of the study). The decline in performance lasted

until the fourth week of the project. However, by the end of the project there had been a 50% increase in the overall productivity of the group.

Phelps (1985) made a number of observations on the basis of post-experimental interviews with the participants in the study. First, the homeworkers noted that it had taken a minimum of one to two weeks to adjust to the home as a work site. Second, participants felt that the one visit per week to the office was "essential" to meet with supervisors and coworkers and to handle mail and inter-office communications. Third, while the managers felt that their work had benefitted from having fewer interruptions and distractions, they reported that working beyond "regular business hours" (8 AM to 5 PM) had also affected their productivity. Fourth, working at home was perceived to have resulted in a number of positive outcomes (e.g., reduced automobile insurance rates, gasoline bills, and dry cleaning costs). Finally, the type and amount of communication between participants and their supervisors was seen as critical to the success of the employee in the home work site.

Supervisors had a less positive reaction to the home-based worker program. The supervisors were almost unanimous in reporting that supervising employees from a distance "... made their jobs more difficult" (Phelps, 1985, p. 37).

Survey Research

Control Data. Control Data Corporation developed an Alternative Work Site (AWS) program (Manning, 1985). Participants worked either within their homes or at "satellite office sites" near their homes. Managers nominated employees for voluntary participation (Manning,

1985). While participants came from a variety of occupational and tenure levels, most of the jobs were "information-oriented" (e.g., programmer analyst, education analyst, senior consultant, general manager; Manning, 1985). Job duties included course design, text and/or software development, pre-sales marketing support, system design, and consulting.

Twenty-seven participants responded to a survey conducted to evaluate the effectiveness of the AWS program. Twenty of their managers were also interviewed. Time spent by participants at the alternative site ranged from one day per week to full-time. The group mean was three days per week at the alternative work site (Manning, 1985).

Working at an alternative site was perceived to have a positive impact on performance. The AWS participants estimated that on average their productivity increased by 35% (Manning, 1985). The managers of the AWS employees stated that worker productivity had increased in 15 out of 25 cases and estimated that the productivity of the AWS workers increased an average of 20% (Manning, 1985).

AWS participants identified a number of advantages and disadvantages associated with working away from the central office. Perceived advantages included reduced commuting costs, an improved working environment, a reduction in interruptions/distractions and an increase in work performance (Manning, 1985). AWS participation was also perceived as resulting in increased satisfaction with the job and the organization (Manning, 1985). Managers of the AWS workers felt that an informal AWS option was useful because it had allowed them to retain some of their most valuable employees (Manning, 1985).

Decreased interaction with coworkers and increased difficulty in separating home and work roles were perceived as the primary disadvantages of the alternative work site (Manning, 1985). The effect of working at home on future promotional opportunities was also an area of concern for the program participants. While nine AWS employees felt that their future career opportunities had been enhanced (due to increased productivity) and eleven anticipated no effect on their careers, seven of the 27 AWS workers felt that their career opportunities might have been damaged due to a loss of visibility within the organization (Manning, 1985). More importantly, a "majority" (no number provided) of the managers of the AWS workers felt that working at an alternative site could negatively affect an employee's career because of reduced contact and visibility within the organization (Manning, 1985).

Personal Computing. Antonoff (1985) presented results from a survey of the readers of Personal Computing Magazine on their experiences with home-based work. The majority of the survey participants were male (289 out of 373).

Half of the sample (50.7%; N = 189) reported that their time spent working at home was in addition to time at another location. Only 11.8% (N = 44) of the respondents identified work done at home as a "regular substitute for work at another location." When asked to state their preference for a given work location, 60.6% (N = 226) of the respondents said that they would prefer an option that allowed them to work at home part of the time and at another location (usually an office) for the remainder of the time (Antonoff, 1985). This option has been labeled as "flexiplace" (Shamir & Salomon, 1985).

Twenty-two percent of the sample (N = 82) would have preferred to work at home full-time while only 4% (N = 15) preferred to work entirely outside of the home.

The most frequently cited reasons for working at home (multiple responses were allowed) included: (1) to work at my own pace (50.9%); (2) to increase my productivity (45.6%); (3) to earn extra income (35.1%); (4) to reduce overhead costs (20.4%); (5) to save commuting time (18.0%); (6) to gain tax benefits (18.0%); (7) to ease conflicts between work and family (13.1%); and (8) to take care of my family (10.5%; Antonoff, 1985). The most frequently cited disadvantage of working at home was a lack of interaction with coworkers (30.6%).

Overall, 52.5% (N = 196) of those responding rated themselves as very satisfied with working at home. Thirty-three percent (N = 123) were "somewhat satisfied" and only 5.4% of the respondents were either somewhat or very dissatisfied with working at home (Antonoff, 1985).

Summary of Empirical Research

Occupational Characteristics. While working at home does not appear to be a viable option for all types of jobs, Harkness (1977, cf. Olson, 1983) estimated that 50% of traditional office activities (e.g., writing, typing, data entry) could be performed by persons working from their homes. Most of the applications of home-based work have involved either low-level clerical employees performing word processing or data entry tasks (e.g., Geisler, 1985; Phelps, 1985) or occupations involving the creative use of information (e.g., McDavid, 1985; Phelps, 1985). Only the AWS program at Control Data (Manning,

1985) involved persons from several "information-oriented" job categories.

For high-level occupations, working at home appears to have its greatest utility for tasks that require periods of uninterrupted concentration or effort. Home-based work appears to be less functional for jobs that require frequent face-to-face meetings or the supervision of others (Phelps, 1985).

Effects on Performance. Following an adjustment period, working at home appears to have a positive effect on work performance. Results have generally been positive for both objective and subjective measures of performance. Using an objective measure of performance, Phelps (1985) reported a mean increase in productivity of 50% for three homeworkers who participated in a trial program. Three computer specialists in the ALMSA project (McDavid, 1985) had individual increases in CPU efficiency rate of 25%, 69%, and 80%. The productivity of the keyers in the Blue Cross/Blue Shield "cottage keyer" program was 102% of the organization's standard compared to 76% of standard for in-office keyers (Geisler, 1985).

Subjective reports also tend to suggest an increase in performance when working at home. Self-estimated productivity of the Control Data telecommuters increased an average of 35%. Supervisors estimated an average productivity increase of 20% for the same sample (Manning, 1985). Almost half (46.5%) of Antonoff's (1985) survey respondents indicated that they worked at home to increase their productivity. McClintock (1981, cf. Olson, 1983) reported increased productivity for a sample of twenty telecommuters when working on routine tasks and increased effectiveness on complex tasks.

Subjective estimates of the performance of homeworkers have not been entirely positive. Olson interviewed 32 persons from five different organizations who worked at home at least part-time (cf. Olson, 1983). Of those interviewed, 22% felt that they were more productive when working at home. However, 31% of the participants felt that they were less productive at home.

Effect on Job Satisfaction. In general, working at home seems to have a positive effect on job satisfaction. McDavid (1985) reported that the morale of employees was improved after working at home. Control Data managers perceived increased job satisfaction among their employees who were working at home (Manning, 1985). Quantitative data to support these perceptions were not reported. Antonoff (1985) found that over three quarters (85.5%) of survey respondents were either somewhat or very satisfied with working at home. Olson (1983) contended that the effect of home-based work on job satisfaction might be moderated by the homeworker's perception of his/her autonomy.

In summary, the early empirical research has focused on the effects of working at home. Generally, home-based work has had a positive effect on both job performance and job satisfaction. However, there are a number of problems in these empirical studies that suggest caution in generalizing from the results.

Problems With Empirical Research

A number of problems are apparent in the empirical research on home-based work. These problems include the use of small samples, potential confounds through "Hawthorne effects," poor measurement of research variables, and lack of theory as a guide for the inclusion of research variables.

The first problem is that the majority of the current information on home-based work has been drawn from studies involving relatively small numbers of participants. Manning's (1985) survey had a sample size of 27. McDavid (1985) had a sample of three computer programmers at the conclusion of the project period. Over half of the 14 work-at-home programs examined by Olson & Primps (1984) contained only three or four participants. Three programs had 10 to 15 participants and only one program involved as many as thirty persons working at home on at least a part-time basis.

Meaningful comparisons between control and treatment groups are difficult with small samples. The power of statistical tests to detect differences between treatment and control groups decreases as sample size declines (Cohen & Cohen, 1983). Statistical significance tests were noticeably absent from all of these studies. Future studies on home-based work should attempt to identify situations (e.g., Antonoff, 1985) or organizations where larger samples might be available.

A second problem with current empirical research involving home-based work is that observed changes in attitudes and performance among participants might be the result of a "Hawthorne effect" (Nilles, 1985). Increases in production for home-based workers may be due to their identification as members of a group receiving special treatment from the organization. The opportunity to work at home was apparently a new program in many of these organizations (e.g., Geisler, 1985; Manning, 1985; McDavid, 1985; Phelps, 1985; Raney, 1985). For example, Geisler (1985) noted that working at home had come to be perceived as a "promotion" by the office clerical staff. For research purposes, one solution to this problem would be to

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identify a sample where the concept of working at home was not new or counter to the prevailing culture within the organization (Olson & Primps, 1984).

A third problem pertains to the measurement and reporting of results for performance and attitudinal variables. For example, the external auditor evaluating the U.S. Army homeworker program criticized the measure of productivity and noted that purported improvements in employee morale had not been quantified (cf. McDavid, 1985). A number of studies did not report critical empirical data. For example, Raney (1985) did not present the performance data for participants in Project Homebound. Phelps (1985) reported a "50% increase" in productivity for homeworkers within the Mountain Bell program but did not describe how performance was operationalized or how the "50%" value was derived. Manning (1985) suggested that the Control Data AWS program was successful in increasing job satisfaction even though satisfaction items were not apparent as part of the survey.

Increased attention is needed to the measurement and reporting of variables in research on home-based work. The use of standardized measures from other areas of organizational research would help to reduce this problem. In addition, the development and use of multiple-item scales would increase the reliability and validity of attitudinal measures (Nunnally, 1978).

The empirical research on home-based work has been generally atheoretical in nature. A lack of theory might be expected within exploratory research involving an emerging technology. However, a conceptual model might be used to guide the selection of variables for

inclusion within an empirical study. In addition, such models might allow one to develop hypotheses based on previous research findings. While presenting no empirical data, two recent articles illustrated the application of a conceptual approach to the area of home-based work. These articles dealt with the quality-of-worklife of home-based employees (Shamir & Salomon, 1985) and their expected level of motivation (Brief, 1985).

Conceptual Efforts

Effects on Quality of Worklife

Shamir and Salomon (1985) conceptually examined the impact of working within the home on an employee's quality of worklife (QWL). QWL was defined as the extent to which an employee's work experiences were personally rewarding and/or devoid of such negative consequences as stress (Shamir & Salomon, 1985).

Shamir and Salomon (1985) developed a series of hypotheses regarding the impact of home work on five dimensions of QWL including task characteristics, social relations, job-related stress, work - nonwork relationships, and power/status/equity. Working at home was hypothesized to increase or decrease perceptions of autonomy depending upon the worker's job level, sex, and childcare responsibilities (Shamir & Salomon, 1985). Working at home was also hypothesized to result in a reduction in the significance of tasks, decreased feedback from others (quantity and/or quality), increased social isolation and decreased quality of social relations. A reduction in consideration behaviors from supervisors, increased role ambiguity, increased work-nonwork conflict, an overall decrease in power, and a decline in

status and opportunities for advancement were also conceptually linked with home-based work (Shamir & Salomon, 1985).

Based on their conceptual analysis, Shamir and Salomon (1985) concluded that a "fixed" work-at-home program (i.e., a program where the employee was required to work at home on a full-time basis) should be treated "with suspicion" from a QWL perspective. However, Shamir and Salomon (1985) distinguished between "fixed" programs and a "flexiplace" option (where the employee could move between the home and the office at his or her discretion). Flexiplace and "neighborhood work centers" (e.g., see Manning, 1985) were suggested as a means of reducing the negative effects of home-based work on the QWL of employees.

Starting from a conceptual basis enabled Shamir and Salomon (1985) to identify a number of potentially important variables for inclusion in future empirical studies. It also allowed for the development of hypotheses on the effects of home-based work based on the results of previous QWL research.

Brief (1985) provided a second example of a conceptual approach to research involving home-based work. Brief utilized expectancy theory to examine the effect of working at home on the motivational level of employees.

Effects on Motivation

Brief (1985) used an expectancy theory framework to examine the question of whether performance differences between home and office workers might be attributable to differences in effort levels. Brief (1985) made three explicit assumptions within his conceptual analysis. He first assumed that home and office workers were performing similar

tasks. The second assumption was that similar personnel policies were applied to both groups. Finally, although describing such differences as "plausible," Brief assumed that the home-based and office workers did not differ in the extent to which they desired certain outcomes. Based on these three assumptions, Brief (1985) concluded that there was little reason within an expectancy framework to anticipate differences in the effort levels of home and office workers.

Summary of Conceptual Efforts

Shamir and Salomon (1985) and Brief (1985) have provided examples of conceptual approaches to the examination of the outcomes associated with home-based work. Shamir and Salomon (1985) concluded that a fixed work-at-home program would be likely to have negative effects on an employee's quality of worklife. Brief (1985) used an expectancy approach to argue against differences in motivation between home and office workers.

The case studies, survey research and conceptual efforts provide an overview of the current state of knowledge regarding home-based work. The empirical studies suffer from a number of methodological problems (e.g., small samples, perceptions of special treatment, poor measurement, atheoretical nature of research) while the conceptual efforts have yet to be linked with data.

Previous research shares a common focus on the effects of working at home. The antecedents of home-based work have not yet been examined (although the importance of such research was discussed by Olson, 1983). The following section presents the development of a conceptual model to serve as the basis for a study investigating the prediction of home-based work activity.

A Study to Examine Variables Relating to Home-Based Work

Introduction

The option to work at home appears to be desirable for persons in high-level, information-oriented occupations. However, there seems to be a large amount of variability in the amount of time that individuals choose to spend working at home when given control over their work location (e.g., see Manning, 1985). It may be possible to predict the amount of time that an individual will choose to spend working at home when given the freedom to do so.

The next section introduces the basic elements of an expectancy approach to the topic of behavioral choice. An adaptation of a model outlined by Parker and Dyer (1976) is presented. Three hypotheses for an exploratory study based on this adapted model are presented at the conclusion of the section.

Development of a Model

Expectancy Theory Research on Behavioral Choice

Basic Terminology. Expectancies, instrumentalities, and valences form the basis for most expectancy theories. Expectancy is defined as an individual's perception of the relationship between a given level of effort and a given outcome or level of performance (Landy & Trumbo, 1980; Lawler, 1973). Expectancy is usually operationalized as a subjective probability (Campbell & Pritchard, 1976).

Instrumentality involves the extent to which the individual perceives the behavior or outcome in question as being "instrumental to" (i.e., "leading to") the attainment of other outcomes (Mitchell &

Beach, 1976). According to Mitchell and Beach (1976, p. 235), the instrumentality of one outcome for another may vary from positive (e.g., "always leading to a given outcome") to negative (e.g., "never leading to a given outcome"). Instrumentality has been measured as either a conditional probability or a subjective correlation (Campbell & Pritchard, 1976).

The valence of an outcome involves the strength of a person's positive or negative affective orientation towards that outcome (Mitchell & Beach, 1976, p. 234). According to Lawler (1973), the valence of an outcome can range from very desirable to very undesirable. Valence has also been operationalized as outcome attractiveness or importance (Campbell & Pritchard, 1976; Landy & Trumbo, 1980; Lawler, 1973; Mitchell, 1974; Parker & Dyer, 1976; Schmitt & Son, 1981).

Previous Research. Expectancy research on behavioral choice has generally focused on "valence models" (Mitchell, 1974) involving perceived instrumentalities and the valence of a given number of outcomes for an individual (Schmitt & Son, 1981). The inclusion of outcome valences has not always been found to enhance predictive accuracy (Muchinsky & Taylor, 1976; Schmitt & Son, 1981). However, the continued inclusion of outcome valences within research involving behavioral choice appears warranted on empirical (Rynes & Lawler, 1983) as well as conceptual grounds (Muchinsky & Taylor, 1976).

A number of studies have supported the use of expectancy theory components to predict either behavioral preference or behavioral choice (e.g., see Mitchell & Beach, 1976; Muchinsky & Taylor, 1976; Rynes & Lawler, 1983; Schmitt & Son, 1981). A distinction has been

made between an individual's preference for a given course of action and his or her actual behavior (Mitchell & Beach, 1976; Schmitt & Son, 1981). Valence models tend to be more accurate when predicting preferences than actual behavior (Parker & Dyer, 1976).

Parker and Dyer (1976) used an expectancy approach to examine the retirement decisions of a sample of Navy career officers. The choice examined in the study was whether the officer would choose to retire after a 20 year period in the Navy or would remain on active duty. Parker and Dyer developed a list of the positive and negative outcomes that might be associated with either choice on the basis of interviews with both active and retired Navy officers.

Using the list of 25 possible outcomes, Parker and Dyer (1976) made correct predictions (retire/remain on active duty) in 62.2% of the 697 cases that they retrospectively examined. Reducing the list to the eight most important outcomes for each individual increased prediction accuracy to 68%, suggesting that it is not necessary to identify all possible outcomes when using an expectancy approach to examine behavioral choice.

Parker and Dyer (1976) suggested the inclusion of "non-expectancy" variables to increase prediction accuracy for actual behavior. Inclusion of an index of wife-family influence increased prediction accuracy in the Parker and Dyer (1976) study to approximately 80%. In addition to an individual's preference for a behavioral choice, Parker and Dyer recommended the measurement of "individual differences", "externally - oriented predictors", and "opportunity" when attempting to predict actual behavior. An

illustration of the Parker and Dyer (1976) model is presented as Figure 1.

Present Study. When given a choice, a valence approach would predict that an individual would prefer the work site (e.g., home or office) that is perceived as being most likely to result in the attainment of valued outcomes (Brief, 1985). In the words of Brief (1985):

Individuals vary considerably in their preferences for work-related outcomes. Thus certain people with certain preferences may choose to work at home because they expect different levels of various outcomes from those working at more conventional sites. (p. 68)

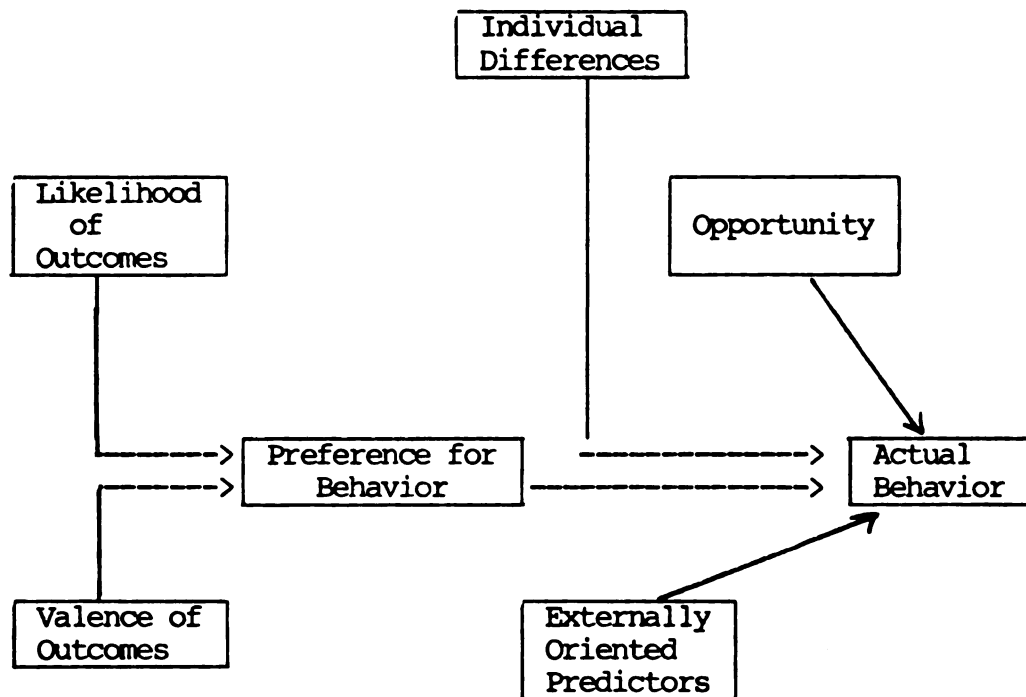


Figure 1. A model predicting behavioral choice.

(Based on Parker & Dyer, 1976)

An individual's preference for the home work site would not be likely to perfectly predict the amount of time that he or she spends in working at home. Using the Parker and Dyer (1976) model as a guide, additional variables can be identified that may be related to the amount of time that an individual actually spends working at home. The three "additional" predictors (individual differences, externally oriented predictors, and opportunity) proposed by Parker and Dyer (1976) are similar to three "antecedents" of home-based work suggested by Olson (1983): (1) individual characteristics, (2) situational characteristics and (3) job characteristics.

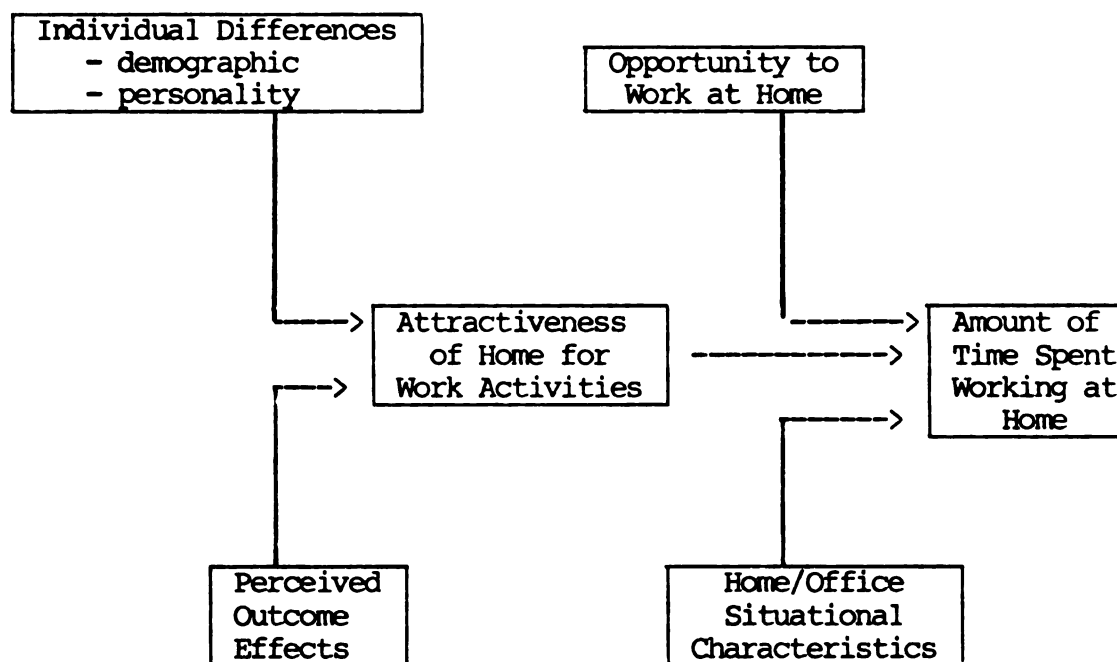


Figure 2. Adapted model to predict time spent working at home.

(Adapted from Olson, 1983; Parker & Dyer, 1976)

A model adapted from the work of Parker and Dyer (1976) and Olson (1983) to predict the amount of time that an individual chooses to spend working at home is presented as Figure 2. For simplicity, the model assumes similar job characteristics within a given occupation (Olson's third "antecedent"; see above). In addition, the two expectancy components (outcome likelihood & outcome valence) have been combined within a single measure (perceived outcome effects).

The model presented in Figure 2 is used to organize a discussion of some of the "non-expectancy" variables that might be indirectly or directly related to the amount of time that an individual spends working at home. A list of these variables is presented as Table 1.

Nonexpectancy Determinants

Individual Differences. The model presented in Figure 2 suggests that individual differences variables are directly related to the perceived attractiveness of the home as a work site and indirectly related to the amount of time that a person spends working at home. Sex, age, and level of seniority are examples of demographic variables that might be related to the perceived attractiveness of the home as a work site. The attractiveness of the home work environment might also be related to an individual's needs for achievement, affiliation, autonomy, and locus of control.

Sex is an example of a demographic variable that may be related to the attractiveness of the home for work activity. Olson (1983) found that males were more likely to work at home because of personal preference. Females were more likely to work at home for family reasons (e.g., childcare). Olson and Primps (1984) reported that, among persons interviewed in their study, all who had chosen to work

at home for childcare reasons were female. As yet, it is not known whether sex is directly related to the perceived attractiveness of the home as a work site or if it is indirectly related to the amount of time that an individual spends working at home.

Previous research has not examined the relationship between age and the attractiveness of the home as a location for work. Older workers may have more self-discipline and therefore might be more attracted to the autonomy of the home than younger workers. However, younger workers might feel more constrained in an office environment and therefore might find the home to be a more attractive work site.

Organizational seniority might be positively related to the perceived attractiveness of the home as a work site. New employees could feel pressure to be "seen" while working (e.g., to create a good impression with coworkers) and therefore might find the home to be a less attractive work site. In contrast, senior employees might find the home environment to be an attractive alternative if it enabled them to avoid the conflicts and interruptions of the office.

There are a number of personality variables that may be directly related to the perceived attractiveness of the home as a work site and indirectly related to the amount of time spent working at home. These personality variables include an individual's needs for achievement, affiliation, and autonomy. Need for achievement has been defined as the extent to which one has goals, tries to complete his or her tasks as quickly as possible, and attempts to give one's best efforts (Friis & Knox, 1972). Persons high on need for achievement prefer situations where they can take personal responsibility for finding problem solutions (Hampton, Summer, & Webber, 1982, p. 15). The

Table 1

Illustration of Non-Expectancy Variables Within Sets

Variables
Individual Differences
Demographic
Sex
Age
Seniority
Personality
Need for Achievement
Need for Affiliation
Need for Autonomy
Locus of Control
Opportunity
Perceived opportunity
Number of meetings/commitments
Reference group supportiveness
Home/Office Situational Characteristics
Number of children
Ages of children
Number of persons in home
Private office at home
Private office at central work site
Personal computer in home
Personal computer at central work site
Commuting time
Number of vehicles in household

successful homemaker has been described as a "high achiever" (Nilles, 1985) and as a "well-organized self-starter" (Manning, 1985).

Although not everyone who attempts to work at home is successful, the statements by Nilles (1985) and Manning (1985) suggest the possibility that need for achievement may be related to the the perceived attractiveness of the home as a work site.

The office environment has been described as the primary location at which people fulfill their needs for affiliation (Albertson, 1977; Brief, 1985). Need for affiliation involves the extent to which one desires to be with, socialize with, and seeks the company of others (Friis & Knox, 1972; Hampton, et al., 1982). Those working at home are likely to have less direct contact with their coworkers (Antonoff, 1985; Brief, 1985). While it is possible that a home-based worker could fulfill affiliation needs through interactions with friends, neighbors, or family members, Brophy (1985) characterized the successful homemaker as someone who is not affected by some amount of solitude or social isolation. This suggests that the possibility of an association between an individual's need for affiliation and the perceived attractiveness of the home as a work environment.

Persons with a high need for autonomy/independence prefer to be left alone to do their work and tend to seek out situations in which they have a greater perception of autonomy (Wexley & Yukl, 1984). One frequently cited advantage of working at home is that it tends to remove one from close monitoring by a supervisor (Antonoff, 1985; Brophy, 1985; Garr, 1984). Persons with a high need for autonomy therefore might perceive the home to be an attractive work site.

Description of home-based workers as "self-motivated" (Brophy, 1985; Manning, 1985; Nilles, 1985) suggests a possible link between locus of control and the attractiveness of the home as a work environment (Olson, 1983). Locus of control pertains to an individual's general perceptions regarding the source or cause of events (Rotter, 1966; Spector, 1982). Persons who generally tend to attribute control of events to themselves are characterized as having an "internal" locus of control. Those who tend to attribute control of events to luck, destiny, chance or others are said to have an "external" locus of control (Spector, 1982).

A person with an internal locus of control may seek out situations where increased personal control is more likely, if the increased control is perceived to lead to desired outcomes (Kimmons & Greenhaus, 1976; Spector, 1982). "Internals" seek to increase influence over events by: (1) altering working conditions; (2) changing the nature of their relationships with supervisors and coworkers; or (3) altering work schedules (Spector, 1982). Better working conditions, a perceived decrease in the closeness of supervision, and increased flexibility in the scheduling of work hours are three of the advantages that employees have cited for choosing to work at home (Antonoff, 1985; Garr, 1984; Manning, 1985; Raney, 1985). Therefore, persons with an internal locus of control may be attracted to the home work site (Olson, 1983). Conversely, individuals with an external locus of control might perceive the home work environment to be unattractive.

Opportunity. Certain factors may place constraints on one's opportunities to work at home. Opportunity could be affected by: (1)

the perceived opportunity to work at home; (2) the number of meetings or other commitments; and (3) the perceived supportiveness of various reference groups towards persons who work away from the central office.

Other things being equal, a positive relationship could be expected between one's perceived opportunity to work at home and the amount of time spent at that location. Intuitively, an individual who perceives limited opportunities to work at home would be expected to spend less time at the home work site.

The frequency of face-to-face meetings and other time commitments may be inversely associated with the amount of time that one has available to work at home. In the pilot programs described by Manning (1985), McDavid (1985), and Phelps (1985), a "core" day was established on which all home-based workers were expected to be present at the office to attend meetings. Frequent meetings or other office commitments might therefore reduce the amount of time that the individual has available for working at home.

The norms of the organization or work group might also relate to the amount of time spent working in the home environment (Olson & Primps, 1984). Norms regulate the behavior of group members (Feldman, 1984). Some pilot programs involving home-based workers have been hindered because the climate and norms of the organization did not support the concept of working away from the supervision and control of the office environment (Olson & Primps, 1984). In effect, the norms of the work group might place psychological limits on the amount of time that it was "acceptable" to spend working at home. A perception that one's work group or organization was hostile to work

done away from the office might therefore be associated with less time at the home work site.

Home/Office Situational Characteristics. Certain characteristics of one's home or office situation might be directly related to the amount of time spent at the home work site. The number and ages of children, the number of persons within the home, access to a private office, the amount of time required to travel to the primary work site, and the number of cars in the household are examples of situational characteristics that might be related to the amount of time that an individual spends working at home.

A decline in the number of interruptions has been reported as one of the major benefits of the home as a work site (e.g., Antonoff, 1985; Brophy, 1985). If children and other persons in the home serve to increase distractions and interruptions, then the amount of time that an individual spends working at home may decrease as the number of children (or other persons) in a household increases.

Antonoff's (1985) survey found that a separate office space in the residence was the most common location for home-based work. Volunteers in McDavid's (1985) study were required to specify some location in their homes as an office. Both findings suggest that access to a private space within the residence might be positively associated with the amount of time spent working at home. Lack of a private space at the organizational work site might also be related to increased time at the home work site.

The performance of certain tasks might require the use of special equipment. In some cases, the physical location of the equipment might determine the amount of time spent at a work location. For

example, a personal computer (PC) might be considered a vital tool for those in information-oriented occupations. Many individuals are apparently buying personal computers to increase their ability to work at home (C. F. Mitchell, 1986). The location of a personal computer might therefore be related to the amount of time spent working in the home environment.

Antonoff (1985), Garr (1984), Manning (1985), and Nilles (1985) discussed the advantages of working at home in relation to commuting costs. Two factors pertaining to commuting might be related to the amount of time spent at the home work site: (1) commuting time from the home to the office; and (2) the numbers of vehicles available within a household.

Reports in the popular press have linked longer commuting time with increased time spent working at home (e.g., Antonoff, 1985). However, it is also possible that individuals having a longer drive to a central office may be more inclined to stay at that location. Individuals residing only a short distance from a central office may find it easier to shift back and forth from the office to the home.

The number of automobiles available in a household may also be related to the amount of time spent working at home. Staying at home during the work day might make the household car available for other uses. Therefore, fewer vehicles in a household may be associated with more time at the home work site.

General Hypotheses

Previous research has suggested a number of variables that may be directly or indirectly related to the amount of time that an individual chooses to spend at the home work site. Because of the

exploratory nature of the present study and the large number of variables potentially linked with home-based work, it was felt that the development of formal hypotheses for specific individual variables would be inappropriate. Instead, individual variables were placed in "predictor sets." A model (see Figure 2) utilizing the predictor sets to account for time spent at the home work site was adapted from the work of Parker and Dyer (1976) and Olson (1983). Based on the conceptual relationships among the predictor sets within this model, three general hypotheses were developed for the present study.

In the adapted model, individual differences and the perceived outcomes associated with working at home are directly related to the perceived attractiveness of the home for work. This is consistent with Parker and Dyer's (1976) contention that expectancy components (represented in the model by the "perceived outcome effects measure") primarily predict an individual's preference for a course of action (represented by the "attractiveness" component). The first general hypothesis for the present study focuses on this relationship between individual differences, the perceived outcomes associated with working at home, and the perceived attractiveness of the home for work activities:

Hypothesis 1: The demographic and personality characteristics of the individual and the outcomes that the individual associates with home-based work will each uniquely account for variance in the extent to which the individual perceives the home to be an attractive location for work activities.

Along with one's preference for a given behavior, Parker and Dyer (1976) concluded that "additional predictors" (e.g., situational characteristics, opportunity) were needed when attempting to predict actual behavior. Consistent with this notion, the adapted model suggests that the perceived attractiveness of the home for work activities, the opportunity to work at home, and the situational characteristics of the home/office predict the amount of time that an individual spends working at home. Of interest in the present study is the extent to which these predictor sets uniquely contribute to the explanation of variance in the criterion (time at the home work site). Therefore, the second general hypothesis is that:

Hypothesis 2: The attractiveness of the home for work activities, the opportunity to work at home, and the situational characteristics of the home/office will each uniquely account for variance in the amount of time that an individual chooses to spend working at home.

The adapted model is based, in part, on the notion that the perceived attractiveness of the home as a work site mediates the relationship between the "indirect" predictor sets (individual differences & the outcomes associated with working at home) and the criterion measure (time at the home work site). This conceptualization follows from the distinction between behavioral preferences and actual behavior (Parker & Dyer, 1976) and the notion that expectancy components predict behavioral preferences, which in turn predict actual behavior. If such a "mediating" relationship is

true, then the "attractiveness" measure should account for variance in the criterion measure beyond that explained by the "indirect" predictor sets. The third general hypothesis focuses on this relationship between the "indirect" predictor sets, the perceived attractiveness of the home for work activities, and the amount of time spent working at home:

Hypothesis 3. In predicting the amount of time that an individual spends at the home work site, the perceived attractiveness of the home for work activities will uniquely account for variance in the criterion measure beyond that explained by individual differences and the outcomes that the person associates with working at home.

Method

Subjects

Home-based work has been applied to information-oriented higher- and lower-level occupations (Shamir & Salomon, 1985). The present study used a survey questionnaire to collect information from individuals in a higher-level occupation: university faculty.

Olson (1983; Olson & Primps, 1984) presented a number of job characteristics for a "typical" higher-level, home-based worker. These characteristics included: (1) minimal requirements in terms of equipment and workspace; (2) individual control over the pace of the work; (3) a project orientation with relatively long-term completion dates; (4) well-defined outputs; (5) well defined "milestones" for marking progress; (6) a requirement for periods of uninterrupted work time; (7) a low need for frequent direct communication with others; and (8) a work setting where traditional attendance was not relevant (Olson, 1983, p. 10; Olson & Primps, 1984).

The advantages of using university faculty as the sample for the survey included: (1) access to a large population when compared with most previous research involving home-based work; (2) less difficulty in the identification of the sample; (3) an organization where working at home on a part-time basis was accepted behavior within some work groups; and (4) the performance of tasks similar to those represented in previous research (e.g., course development, writing). University

faculty also appeared to share a number of job characteristics (e.g., control over work pace; a requirement for periods of uninterrupted work time; a work setting where traditional attendance was not relevant) in common with other high-level home-based workers (Olson, 1983; Olson & Primps, 1984). Finally, professors/researchers were the largest subgroup of respondents to Antonoff's (1985) magazine survey and therefore represent a known subgroup within the population of individuals currently working at home.

A total of 183 faculty members at a large Midwestern university voluntarily participated in the study. Because demographic variables were part of the individual differences set, sample characteristics are presented as part of the Results section. The representativeness of the sample in relation to the faculty population of the university is also described as part of the Results section.

Procedure

The purpose of the study was to identify predictors of the amount of time that a faculty member spent working at home. It was decided that a survey would be an efficient method to gather the information required in a reasonable period of time. Previous research on home-based work was reviewed to identify variables for inclusion on the survey. The adapted model presented in Figure 2 was used to organize the variables into sets.

Following the development of a draft version of the survey, five faculty members were interviewed. The principal objectives of the interviews were to: (1) examine the comprehensiveness of the list of outcomes associated with working at home; (2) identify the work activities that faculty members frequently performed at home; and (3) elicit suggestions for modifications of the draft version of the questionnaire. Summaries of the faculty interviews are presented in Appendix A.

After the faculty interviews, a pilot measure including the outcomes and several personality scales was given to a sample of undergraduate students. The purpose of the pilot survey was to: (1) identify poorly worded items/outcomes; (2) gather preliminary internal consistency information on the personality measures. Based on the results of the pilot survey, several personality scales were combined, a number of items were revised, and several items were discarded.

"Survey Recruitment" letters were mailed to all full- and part-time faculty at a large midwestern university. A copy of the recruitment letter is presented in Appendix C. The purpose of the recruitment letter was to identify faculty who were interested in

participating in the survey. Only faculty who returned the recruitment letter were sent a copy of the questionnaire. A complete copy of questionnaire and the accompanying cover letter are presented in Appendix D. A follow-up letter and a "back-up" copy of the questionnaire were sent to those persons who had not returned the questionnaire within a prescribed period of time. A copy of the follow-up letter is presented in Appendix E.

Measures

Individual Differences: Personality

A review of the literature identified four personality characteristics that had potential links with home-based work. The four traits included: (1) need for achievement; (2) need for affiliation; (3) need for autonomy/independence; and (4) locus of control (internal and external). A pilot questionnaire was constructed containing items designed to measure the four personality traits.

Items from the Manifest Needs Questionnaire (MNQ; Steers & Braunstein, 1976) were used to measure needs for achievement, affiliation, and autonomy. Because the internal consistency of these scales had been questioned (cf. Cook, Hepworth, Wall, & Warr, 1983; Dreher & Mai-Dalton, 1983), three additional items were added to each scale for the pilot questionnaire. Additional items for the achievement scale were adapted from Friis and Knox (1972) and Mehrabian and Bank (1978). Additional items measuring need for affiliation were adapted from the Friis and Knox (1972) scale. Three original items were written to supplement the MNQ need for autonomy scale. Items to measure internal and external locus of control were

adapted from the Internal Control Index (ICI; Duttweiler, 1984). Item content and factor loadings were used to reduce the original 14-item ICI scales to seven items per scale (internal and external).

A complete list of the original personality scales is presented in Appendix B. The adapted items for the pilot questionnaire are also presented in Appendix B. Responses to all items were made using a seven-point Likert-type scale (1 = Never; 4 = Sometimes; 7 = Always).

Table 2

Pilot Study: Personality Measures (Revised)

Scale	# of Items	N	Scale Intercorrelations
Need for Achievement	5	54	(.65)
Need for Affiliation	6	54	-.02 (.61)
Need for Autonomy	7	53	.31 -.20 (.65)
Locus of Control (Ext.)	6	54	.00 .27 -.08 (.68)
Locus of Control (Int.)	5	55	.71 -.10 .55 -.06 (.57)

Note: Decimals omitted to conserve space

a = Coefficient alpha presented in diagonal

A pilot study using a sample of undergraduate students was conducted to examine the internal consistency and intercorrelations among the personality measures. Intercorrelations and internal consistency estimates for the personality measures following the pilot study are presented as Table 2.

Because of low internal consistency estimates and high intercorrelations among the "revised" (i.e., "best-case") versions of the scales used in the pilot study, the pilot measures of need for achievement, need for autonomy, and internal locus of control were combined in a single scale for the faculty survey. Several items in the need for affiliation and external locus of control scales were also revised or eliminated. The faculty questionnaire therefore contained scales designed to measure need for achievement, need for affiliation, and external locus of control. The final versions of the personality measures are presented in Appendix B.

Perceived Outcome Effects

Twenty-seven outcomes associated with working at home were identified based on a review of previous literature (e.g., Antonoff, 1985; Brophy, 1985; Manning, 1985; Phelps, 1985; and Shamir & Salomon, 1985) and faculty interviews. The "Perceived Outcome Effect" (POE) rating scale combined a rating of the perceived effect of working at home on an outcome (e.g., working at home as having a "strong," or "weak" effect on "Time with Family") with a rating of the desirability of that effect for the outcome (e.g., a "strong effect" on "Time with Family" as desirable or undesirable). Respondents were asked to rate the perceived effect of working at home on each outcome using a seven-point scale (1 = Strong Effect, Undesirable; 4 = No Effect; 7 = Strong Effect, Desirable).

Attractiveness of Home for Work

Faculty members were interviewed to identify the work activities that they performed at home. A list of the activities described by those interviewed is presented as Table 3. The list of activities was

shortened to reduce the difficulty of the rating task. Seven specific work activities (meeting with students, class preparation, talking on the telephone, grading papers and examinations, data analysis and statistical interpretation, writing, & reading) were included on the questionnaire in addition to a global item (attractiveness for work-total). Faculty were asked to rate the attractiveness of the home environment for each activity using a 7-point Likert-type scale (1 = Very Unattractive; 4 = Neutral; 7 = Highly Attractive).

Opportunity to Work at Home

Five variables comprised the Opportunity set. The five variables were: (1) the perceived opportunity to work at home (OPPORTUNITY); (2) the extent to which a faculty member was required to monitor others (MONITOR); (3) the amount of time spent per week in university-related meetings (MEETINGS); (4) the amount of time spent in the classroom (CLASS); and (5) the perceived supportiveness of reference groups for home-based work (SUPPORT).

Perceived opportunity and monitoring of others were each measured using a single item. The question, "In comparison with other faculty, how often do you perceive that you have the opportunity to work at home?" was used to measure OPPORTUNITY. A subject's response to the question, "What is the frequency with which your work requires you to monitor the work of others?" was used to operationalize monitoring of others. Responses to both items were made using a seven-point rating scale (1 = Never; 4 = Sometimes; 7 = Always).

Table 3

Interview Results: Work Activities Performed by
Faculty While at Home

Work
Activity

Writing	manuscripts research proposals research presentations class lectures letters of recommendation memos correspondence with colleagues committee work student feedback
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Reading	journal articles theses & dissertations draft papers manuscripts grant applications mail and other correspondence
---------	--

Data	analysis reduction editing
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Statistical Interpretation

Computer programming

Word processing

Manuscript reviews

Grading student papers & exams

Telephoning

Research meetings with graduate students

Open-ended questions were used to measure time in meetings (MEETINGS) and the classroom (CLASS). Survey participants were asked, "What is the approximate number of hours that you are required to spend in university meetings during an average week?" The second item asked, "For the current term [Spring], how many hours per week do you typically spend in a classroom (e.g., lecturing)?"

Five items were used to measure the individual's perceptions of the supportiveness of reference groups toward home-based work by university faculty. The five reference groups included: (1) other faculty within one's program ("To what extent do you feel the other faculty members in your program support colleagues who work at home?"); (2) students ("To what extent do you perceive that the students in your program support the idea of faculty working at home?"); (3) one's department ("In general, how supportive do you feel members of your department/division are of faculty working at home?"); (4) the university administration ("To what extent do you feel the CENTRAL ADMINISTRATION supports the idea of faculty working at home?"); and (5) others at one's residence ("Overall, to what extent do you feel the other persons living at your residence support your working at home?"). All ratings were made using a seven-point scale (1 = Strongly Oppose; 4 = Neutral; 7 = Strongly Support).

Home/Office Situational Characteristics

Survey participants were asked to provide information on number of variables related to their home and office work environments. The variables measured as part of the Home/Office Situational Characteristics set included the location of a personal computer,

availability of separate office space, number of children and others in the home, length of commute, and number of available vehicles.

The survey contained two items regarding personal computer (PC) location. The first question asked, "Do you have a personal computer within your home?" The second item asked, "Do you have a personal computer at your office/lab?" Both items called for a "Yes" or "No" response. A response of "Yes" was coded as a "1" while a "No" response was coded as "0." For the "Home" item, persons indicating access to a terminal or word processor were coded as "1". For the "Office" item, responses indicating only a shared departmental PC were coded as "0".

Survey participants were asked to respond with a "Yes" or "No" response to two items regarding the availability of a separate office. The first item asked, "Do you have a separate office space within your residence (e.g., a room with a door that can be closed)?" The second question asked, "Do you have a private office space at your office/lab?" For both items a response of "No" was coded as "0"; a response of "Yes" was coded as "1".

The questionnaire contained a number of items designed to gather information concerning others in the home. Two items pertained to children. Subjects were first asked to report the number of children/adolescents currently living in the residence. Participants were also asked to provide the ages of the children/adolescents. Because parents or others might live in the residence, a third item asked, "Including yourself, what is the total number of persons who are currently living at your residence?"

Faculty were questioned about two aspects of their commuting situation. The first item concerned the average time to commute between home and office ("For a one-way trip, what would be the average amount of time in minutes that it would take you to travel [by car] to your office?"). The second question asked, "How many automobiles are available to persons living at your residence?"

Relative Time at Home

A two step process was used to measure relative time spent working at home. First, participants were asked to provide an estimate of the total amount of time that they spent working during a typical week. Second, respondents were asked to estimate the total amount of time spent working at home during the same "typical" week. To provide some estimate of the reliability of the measure, a single item asking for a direct estimate of the relative amount of time worked at home by the faculty member was included as part of the initial survey recruitment letter.

Method of Analysis

Data analyses proceeded in three stages. Descriptive results for individual items and scale scores were computed in the first stage of the analysis process. Internal consistency of composites was also examined as part of the first stage. In the second stage, correlations between the predictor variables and the criterion measure were calculated. The final stage in the data analyses used hierarchical regression to examine the general hypotheses of the study.

Cohen and Cohen (1983) advocated hierarchical regression as a useful statistical method for exploratory research involving a large

number of variables. In this approach, predictors are entered as sets into a regression equation. The significance of the change in R identifies the relative contribution of a given predictor set towards explanation of criterion variance.

Results

Introduction

Survey results are presented in several sections. The first section addresses the issue of the representativeness of the survey sample. The sample and the academic faculty for the university are compared on a number of variables. The second section presents descriptive results for the predictor variables. To increase clarity of presentation, results for predictors are presented within sets (e.g., "Individual Differences", "Perceived Outcome Effects", etc.). Reliability results for composite variables are presented as part of this section. The third section presents descriptive statistics for the criterion measure. Correlational results for the predictor variables and the criterion are presented in the fourth section. The chapter concludes with sections describing the results of the regression analyses testing the general hypotheses and post-hoc analyses.

Representativeness of the Survey Sample

Recruitment of Survey Participants

A "Survey Recruitment Letter" (SRL) was mailed to all full and part-time faculty members at a large Midwestern university during the final regular class week of the spring term. Individuals with an off-campus office address or who were classified as administrators,

directors, deans, or chairpersons were excluded from the potential sample. The "recruitment letter" approach was used to reduce survey printing costs and to obtain a convergent estimate of the criterion (percent time spent working at home by the participant during a typical week). A copy of the SRL is included in Appendix C. SRLs were mailed to 2276 faculty members. Two of the SRLs were returned by campus mail as undeliverable. The potential sample for the survey was therefore 2274.

The response rate to the SRL was 9.6% (N = 219). A cover letter explaining the nature of the study and a copy of the Work-at-Home Questionnaire were mailed to each participant following the return of his or her SRL. The cover letter requested the return of the questionnaire within a given time-frame. A follow-up letter and a back-up copy of the questionnaire were sent to those faculty members who had not returned their initial questionnaire within three weeks. Copies of the cover letter and the questionnaire are presented in Appendix D. The follow-up letter is presented in Appendix E.

Four of those returning the SRL subsequently left the university (either permanently or on summer sabbatical) prior to completing the Work-at-Home Questionnaire. A total of 183 questionnaires were returned by the end of July. Based on a potential sample of 219, this was a response rate of 83.6% (85.1% excluding those who left on sabbatical).

Sample Characteristics

Table 4 presents descriptive information for the survey sample and for the academic faculty as a whole. Population data were calculated from academic personnel records for the university for

April, 1986. Males (N = 137; 74.9%) were more prevalent in the sample than females (N = 46; 25.1%). This was similar to the proportion of male faculty in academic units for the university (78.1%; N = 1693). The mean age of the respondents was 45.4 years (S.D. = 10.73). The sample-weighted estimate of the mean age of the academic faculty was 46.11.

Over four-fifths of the survey respondents (N = 157; 86%) held tenure-track positions, compared with 77.1% (N = 1672) for the university population. Almost two-thirds (62.5%; N = 1355) of faculty members in the university had been granted tenure. Similarly, two-thirds (N = 124; 67.8%) of the sample were tenured.

Persons holding the rank of full professor made up the largest group among those responding (44.8%; N = 82) and in the university population (43.5%; N = 944). Associate professors represented 25.1% (N = 46) of the sample and 22.2% (N = 481) of the population. Assistant professors comprised 25.7% (N = 47) of the survey respondents and 24.9% (N = 539) of the academic faculty. Finally, 4.4% (N = 8) of the respondents held the rank of instructor compared to 9.5% (N = 205) for the university as a whole.

Table 4

Descriptive Information for the Survey Sample and
for the Academic Faculty as a Whole

Variable	Survey N	Sample %	Academic Faculty N	Academic Faculty %
Sex				
Male	137	74.9	1693	78.1
Female	46	25.1	476	21.9
Tenure Track				
Tenure track	157	87.7	1672	77.1
Nontenure track	22	12.3	497	22.9
Tenure Status				
Tenured	124	67.8	1355	62.5
Untenured	59	32.2	814	37.5
Academic Rank				
Instructor	8	4.4	205	9.5
Assistant Professor	47	25.7	539	24.9
Associate Professor	46	25.1	481	22.2
Professor	82	44.8	944	43.5
Total Sample	183	-	2169	-

Table 5

Composition of the Survey Sample by College

College	N	Sample % of Sample	N	University % of Faculty
Agric. & Nat. Res.	27	15.3	270	12.4
Arts & Letters	20	11.4	296	13.6
Business	10	5.7	128	5.9
Communications Arts	7	4.0	63	2.9
Education	15	8.5	160	7.4
Engineering	9	5.1	101	4.7
Human Ecology	5	2.8	52	2.4
Human Medicine	14	8.0	238	11.0
James Madison	3	1.7	22	1.0
Natural Sciences	16	9.1	330	15.2
Nursing	5	2.8	39	1.8
Osteopathic Medicine	7	4.0	118	5.4
Social Science	24	13.6	195	9.0
Veterinary Medicine	10	5.7	133	6.1
Other	4	2.3	24	1.1
Total N	176		2169	

Table 5 presents information concerning the representativeness of the survey sample across colleges in the university. Seven respondents did not provide information identifying the college in which they worked. The largest number of survey respondents (15.3%; N = 27) were members of the College of Agriculture and Natural Resources. This was the third largest college in the university with 270 full and part-time faculty (12.4% of campus faculty). Visual comparison between the percentages indicates a close correspondence between the survey sample and the university population. The most under-represented college in the survey was the College of Natural Sciences (15.2% of university faculty compared with 9.1% of survey respondents). The College of Social Science was the most over-represented college in the sample (9.0% of university faculty compared with 13.6% of survey respondents).

While the number of faculty willing to participate in the survey was low (9.6%), nearly 85% of those who expressed initial interest in the survey ultimately returned the questionnaire. In general, the survey sample did not appear to differ dramatically from the university faculty in terms of sex, age, tenure status, rank, or distribution among colleges. The sample therefore appeared to be adequate for the purposes of exploratory research.

Descriptive Results for Predictor Variables

Individual Differences Variables

A number of individual differences variables were included in the survey to examine their relationship with time spent working at home. Demographic variables included respondents' sex, age, tenure/nontenure track, tenure status and rank. Personality scales included measures of participants' needs for achievement and affiliation, and external locus of control.

Demographic Variables. Demographic results were presented in the section describing the representativeness of the sample (see Tables 4 & 5). A brief synopsis of the results is provided in this section. Approximately three-quarters of those responding to the survey were male (74.9%; N = 137). The mean age of those surveyed was 45.4 years (S.D. = 10.73). One hundred and fifty-seven of those surveyed occupied tenure track positions. One hundred and twenty-four participants were tenured. Eight participants held the rank of instructor, 47 were classified as assistant professors, 46 were classified as associate professors, and 82 (44.8%) held the rank of full professor.

Personality Variables. The questionnaire contained scales designed to measure a respondent's need for achievement, need for affiliation, and external locus of control. The items comprising the personality scales are presented in Appendix B. Responses to personality items were made using a seven-point rating scale (1 = Never; 4 = Sometimes; 7 = Always). Composite scores were created by summing across items and dividing by the number of items in the scale.

Item means, standard deviations, and inter-item correlations for the Need for Achievement scale (NAch) are presented in Table 6. As might be expected for a sample consisting of university faculty, the NAch scale mean was above the midpoint of the rating scale ($M = 4.87$). The standard deviation for the composite was 0.59. The internal consistency of the NAch scale ($\alpha = .67$) was similar to values reported for these items in previous research (e.g., Dreher & Mai-Dalton, 1983).

Need for affiliation (NAff) scale information is presented in Table 7. One item was recoded prior to summation. The mean value for the NAff scale was 2.89 (S.D. = 0.77). Coefficient alpha for the scale was 0.67.

The average score for the External Locus of Control scale was 3.24 (S.D. = 0.83). Descriptive statistics for the scale are presented in Table 8. Coefficient alpha for the scale was .76.

Table 6

Need for Achievement Scale: Means, Standard Deviations,
& Inter-Item Correlations

			Inter-Item Correlations										
Item #	M	S.D.	1	2	3	4	5	6	7	8	9	10	11
1	5.37	1.18	-										
2	5.95	0.91	.19	-									
3	4.19	1.32	.13	.10	-								
4	4.70	1.40	.13	.01	.30	-							
5	5.08	1.15	.14	.04	.17	.30	-						
6	5.72	1.17	.20	.26	.19	.14	.14	-					
7	3.70	1.62	.19	.00	.22	.17	.10	.04	-				
8	5.01	1.05	.13	.37	.28	.05	-.01	.23	.29	-			
9	5.24	1.02	.27	.13	.18	.07	.16	.16	.08	.21	-		
10	3.54	1.31	.06	.07	.24	.12	.28	.20	.14	.12	.17	-	
11	5.04	1.14	.14	.35	.27	-.08	.06	.12	.15	.36	.21	.10	-

Note: Decimals omitted to conserve space.

N = 166

Scale M: 4.87

Coefficient α = .67

Scale S.D.: 0.59

Table 7

Need for Affiliation Scale: Means, Standard Deviations,
& Inter-Item Correlations

			Inter-Item Correlations				
Item #	M	S.D.	1	2	3	4	5
1	3.24	1.09	-				
2	2.57	1.43	.31	-			
3	2.82	1.21	.11	.25	-		
4	3.45	1.11	.47	.18	.20	-	
5	2.34	0.97	.41	.37	.32	.36	-

N = 176

Scale M: 2.89

Coefficient α = .67

Scale S.D.: 0.77

Table 8

External Locus of Control Scale: Means, Standard Deviations, & Inter-Item Correlations

Item #	M	S.D.	Inter-Item Correlations					
			1	2	3	4	5	6
1	3.82	1.10	-					
2	2.80	1.21	.35	-				
3	3.38	1.14	.30	.22	-			
4	3.29	1.32	.40	.52	.33	-		
5	2.99	1.14	.26	.44	.15	.45	-	
6	3.11	1.38	.29	.32	.23	.58	.37	-

N = 177

Scale M: 3.24

Coefficient α = .76

Scale S.D.: 0.83

Table 9

Variable Intercorrelations: Individual Differences Set

Variable	Inter-Correlations							
	1	2	3	4	5	6	7	8
1. Sex	-							
2. Age	.29	-						
3. Academic Rank	.43	.72	-					
4. Tenure Track	.41	.21	.55	-				
5. Tenure Status	.38	.65	.84	.53	-			
6. Achievement	.08	-.07	.11	.06	.04	-		
7. Affiliation	.05	-.10	-.05	-.05	-.09	-.02	-	
8. External Loc.	-.03	-.15	-.11	.04	-.15	-.04	.47	-

Note: Decimals omitted to conserve space.

Intercorrelations Among Variables. Variables were placed within a given predictor set on conceptual basis. For informational purposes, Table 9 presents the intercorrelations among the variables within the Individual Differences set. Examination of Table 9 appears to support a distinction between demographic and personality variables. In general, the demographic variables were highly intercorrelated ($\bar{r} = .50$). The correlations between the demographic and the personality variables were low and non-significant (absolute $\bar{r} = .079$). Among the personality scales, Need for Affiliation and External Locus of Control were significantly related ($r = .47$, $p < .001$).

Perceived Outcome Effects

Based on a review of previous literature and interviews with faculty members, a list of 27 outcomes associated with working at home was developed. Respondents were asked to rate the perceived effect of working at home on each outcome using a seven-point scale. The "Perceived Outcome Effect" (POE) rating scale combined a rating of the perceived effect of working at home on an outcome with a rating of the desirability of that effect for the outcome. An attempt was made to phrase the outcomes in a neutral manner. Descriptive statistics for the outcomes are presented in Table 10.

Depending on the outcome, working at home was perceived by faculty to have positive or negative effects. On average, the most positive perceived effect of working at home was for the outcome "Amount of time available for working" ($M = 5.39$; $S.D. = 1.29$). High positive ratings were also given to the outcomes "Control over the

scheduling of work" ($M = 5.34$; $S.D. = 1.39$), "Physical comfort while working" ($M = 5.32$, $S.D. = 1.25$), "Overall work performance" ($M = 5.30$, $S.D. = 1.44$) and "Working at my own pace" ($M = 5.05$; $S.D. = 1.34$).

The most negative perceived effect of working at home was for the outcome "Access to resources (e.g., phone, copiers, secretaries)" with a mean rating of only 2.82 ($S.D. = 1.12$). The outcomes "Communication with peers" ($M = 3.17$; $S.D. = 1.24$), "Access to materials" ($M = 3.18$; $S.D. = 1.61$), "Conflict between work and nonwork roles" ($M = 3.46$; $S.D. = 1.17$), and "Loneliness" ($M = 3.85$; $S.D. = 0.75$) also received negative ratings.

Rather than treat all 27 outcomes as individual variables, factor analysis was used to identify composites within the outcome ratings. A principal components analysis (SPSS; Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) was used to conduct the factor analysis. Eigenvalues for factors prior to rotation are graphically presented in Figure 3. On the basis of the scree test (Cattell, 1966), a five factor solution was chosen. While not always resulting in an optimal solution, the scree test has been found to be a generally acceptable method for determining the number of factors to retain within factor analysis (Zwick & Velicer, 1986). Factor loadings following varimax rotation are presented in Table 11. Item 6 (Caring for Children) was eventually omitted to increase the internal consistency and sample size of the third composite.

Table 10

Means and Standard Deviations for the Perceived Outcome
Effect (POE) Ratings

Outcome #	Outcome	POE Rating*		
		N	M	S.D.
1.	Interruptions while working	170	4.75	2.11
2.	Distractions from working	169	4.32	2.00
3.	Working at my own pace	167	5.05	1.34
4.	Time spent commuting	168	4.57	1.18
5.	Conflict between work and nonwork roles	163	3.46	1.17
6.	Caring for small children	92	3.97	1.12
7.	Costs for day care	88	4.18	0.78
8.	Work attire	152	4.58	0.90
9.	Costs for gasoline	157	4.35	0.82
10.	Costs for dry cleaning	151	4.11	0.54
11.	Overall work performance	166	5.30	1.44
12.	Communication with peers	165	3.17	1.24
13.	Motivation to work	167	4.49	1.48
14.	Reduction of work-related stress/anxiety	163	4.93	1.16
15.	Perceived safety	149	4.18	0.76
16.	Amount of space available for working	164	4.52	1.30
17.	Control over the scheduling of my work	167	5.34	1.39
18.	Physical comfort while working	167	5.32	1.25
19.	Access to materials (e.g., journals, files)	170	3.18	1.61
20.	Loneliness	164	3.85	0.75
21.	Access to resources (e.g., phone, copiers, secretaries)	168	2.82	1.12
22.	Access to food	163	4.19	1.22
23.	Time with family	147	4.71	1.17
24.	The amount of time spent alone	163	4.39	1.14
25.	Time available for working	167	5.39	1.29
26.	Career opportunities	158	4.27	0.98
27.	Participation in office politics	163	3.99	1.29

* = Ratings made using scale where 1 = "Strong Effect, Undesirable"; 4 = "No Effect"; and 7 = "Strong Effect, Desirable"

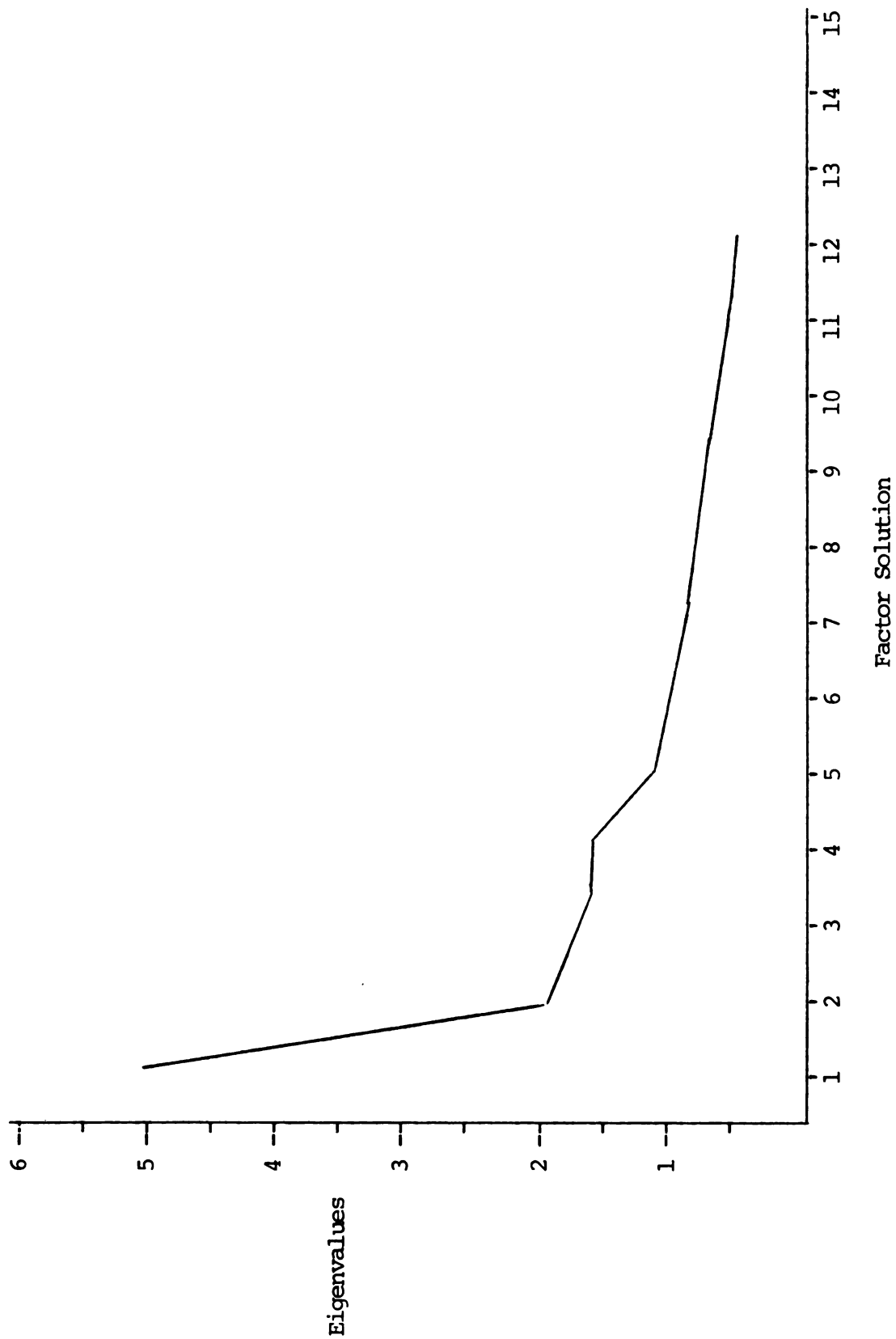


Figure 3. Eigenvalues for POE Factor Analysis

The outcomes comprising the composites identified by the factor analysis are presented as Table 12. The outcomes "Interruptions while working" and "Distractions from working" had the highest loadings on the first factor. Composite 1 was therefore labeled "Effects on Number of Interruptions & Distractions." Additional outcomes in the factor included "Work/nonwork role conflict," "Overall work performance," "Amount of space available for work," and "Control over scheduling of work." Coefficient alpha for "Interruptions/Distractions" composite was .80.

Outcomes in Composite 2 dealt with communication with peers, motivation to work, access to materials and resources, and career opportunities. Additional outcomes in this scale included time spent alone and participation in office politics. All of these outcomes appeared to be related by the issue of access (to either persons or materials/resources). Composite 2 was named "Effects on Access" to reflect this common theme ($\alpha = .70$).

Composite 3 was titled "Effects on Comfort" because all of the outcomes comprising the scale pertained to some form of comfort. Outcomes in the third composite included effects on work attire, safety, physical comfort, and access to food. The internal consistency of the "Comfort" composite was marginal ($\alpha = .51$).

Time spent commuting, costs for gasoline, and costs for dry cleaning were the outcomes included in the fourth composite. Because two of the three outcomes were associated with elements of one's

Table 11

Factor Analysis of Perceived Outcome Effect (POE) Ratings

Principal Components Factor Matrix Following Varimax Rotation					
Item #^	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1	.86	-.04	.06	.15	-.25
2	.84	.08	.05	.07	-.18
5	.46	.27	-.18	.06	.33
11	.68	.44	.17	.09	.12
16	.49	.10	.39	-.21	.11
17	.50	.15	.43	.06	.12
12	-.22	.64	.05	-.03	-.27
13	.36	.63	.24	.10	.14
19	.25	.60	.09	-.08	.04
21	.16	.59	-.26	.07	-.02
24	.14	.47	-.10	-.03	.28
25	.38	.48	.18	.09	.09
26	-.04	.56	.03	.14	-.05
27	-.01	.28	.10	-.19	-.06
6*	-.46	.12	.63	-.01	-.25
8	.09	-.06	.38	.17	.28
15	.14	-.22	.69	.07	.09
18	.36	.42	.57	.07	.22
22	.04	.10	.45	.05	-.11
4	.08	.05	.08	.70	-.06
9	.08	-.03	.14	.83	-.04
10	.00	.09	.03	.76	.14
7	-.17	-.15	-.02	-.05	.63
14	.18	.21	.29	.31	.43
20	.00	.16	.17	-.23	.49
23	.00	-.04	-.06	.17	.70
3 \$	.22	.30	.30	.18	.22
Eigen.	5.40	2.22	1.98	1.81	1.80
% Var.	20.0	8.2	7.3	6.7	6.7

^ = Outcome numbers correspond to numbering in Table 10

* = Item recoded; later excluded

\$ = Excluded; ambiguous loading

Note: Factor analysis conducted using SPSS PA1 program with unities in the diagonal.

Table 12

Content of Perceived Outcome Effect (POE) Composites

Composite 1: Effects on Interruptions/Distractions

- 1.* Interruptions while working
- 2. Distractions from working
- 5. Conflict between work and nonwork roles
- 11. Overall work performance
- 16. Amount of space available for working
- 17. Control over the scheduling of my work

Composite 2: Effects on Access

- 12. Communication with peers
- 13. Motivation to work
- 19. Access to materials (e.g., journals, files)
- 21. Access to resources (phone, copiers, secretaries)
- 24. The amount of time spent alone
- 25. Time available for working
- 26. Career opportunities
- 27. Participation in office politics

Composite 3: Effects on Comfort

- 8. Work attire
- 15. Perceived safety
- 18. Physical comfort while working
- 22. Access to food

Composite 4: Effects on Commuting

- 4. Time spent commuting
- 9. Costs for gasoline
- 10. Costs for dry cleaning

Composite 5: Effects on Family Situation

- 7. Costs for day care
- 14. Reduction of work-related stress/anxiety
- 20. Loneliness
- 23. Time with family

* Outcome numbers correspond to numbering in Table 10

commuting situation, the factor was labeled as "Effects on Commuting." Dressing up for the office (i.e., costs for dry cleaning) might also be perceived as a cost of "going to work." Coefficient alpha for the composite was 0.64.

Finally, two of the outcomes in Composite 5 related to family issues. The outcomes with the highest loadings for the factor were "Time with family" and "Costs for day care." Additional outcomes dealt with loneliness and reduction of work-related stress/anxiety. The latter two outcomes added some confusion to the nature of the composite. The ambiguity of the item content was reflected in the internal consistency of the scale ($\alpha = .48$). The composite was tentatively labeled as "Effects on Family Situation."

Table 13

Descriptive Statistics and Inter-Correlations for the
Perceived Outcome Effects (POE) Composites

Composite	N	M	S.D.	Correlations Among Composites				
				I/D	Acc	Cmf	Com	Fam
Interruptions	158	4.58	1.14	(80) *				
Access	152	3.94	0.72	42	(70)			
Comfort	139	4.57	0.66	39	31	(51)		
Commuting	148	4.31	0.65	11	12	16	(64)	
Family	88	4.46	0.63	05	18	24	05	(48)

Note: Decimals omitted

* Coefficient alpha presented in diagonal

Scores for the five composites were computed by summing across items and dividing by the number of items within each composite. Descriptive results for the composites are presented in Table 13. Sample size for the fifth composite (Effects on Family Situation) was reduced because of low response rate for the outcome "Costs for day care". Working at home was perceived to have its strongest positive effect on Interruptions/Distractions ($M = 4.58$; $S.D. = 1.14$) and a negative effect on Access ($M = 3.94$; $S.D. = 0.72$).

The correlations between the Perceived Outcome Effects composites are presented as part of Table 13. The perceived effects on "Access" and "Interruptions/Distractions" were moderately correlated ($r = .42$, $p < .001$). The "Interruptions/Distractions" composite was also positively related to "Effects on Comfort" ($r = .39$).

Attractiveness of Home for Work

Survey participants made several ratings regarding the attractiveness of the home as a work environment. One item measured the overall attractiveness of the home for work. Respondents also rated the attractiveness of the home for seven work activities. Responses were made using a seven-point rating scale (1 = Very Unattractive; 4 = Neutral; 7 = Highly Attractive).

Means and standard deviations for the attractiveness items are presented in Table 14. The home was perceived by faculty as being most attractive for the activity "Reading" ($M = 5.95$; $S.D. = 1.32$). The home was also perceived as an attractive work site for "Grading Papers" ($M = 5.79$; $S.D. = 1.22$) and "Writing" ($M = 5.73$; $S.D. = 1.73$). "Meeting with Students" was the only work activity to receive an

average attractiveness rating on the negative side of the scale ($M = 2.39$; $S.D. = 1.67$).

Ratings of work activities were combined into a single scale measuring the attractiveness of the home as a work environment. Inter-item correlations and scale information are presented as part of Table 14. Coefficient alpha for the composite was .81. Composite scores were formed by summing across items and dividing by the number of items in the scale. The Attractiveness Scale had a mean of 4.87 and a standard deviation of 1.05.

Opportunity to Work at Home

The five variables comprising the Opportunity set were: (1) the perceived opportunity to work at home (OPPORTUNITY); (2) the extent to which the faculty member was required to monitor the work of others (MONITOR); (3) the amount of time spent per week in university-related meetings (MEETINGS); (4) amount of time spent in the classroom (CLASS); and (5) the perceived supportiveness of reference groups for faculty who worked at home (SUPPORT). Tables 15 and 16 present the results for these variables.

OPPORTUNITY and MONITOR were each measured using a single item. Ratings for both items were made on a seven-point scale (1 = Never; 4 = Sometimes; 7 = Always). On average, survey participants reported that they had the opportunity to work at home slightly over 50% of the time ($M = 4.17$; $S.D. = 1.32$). While participants reported that they were not required to spend all of their work-related time monitoring the work of others ($M = 3.80$), there were wide differences among faculty in relation to this requirement ($S.D. = 2.41$).

It was assumed that time in meetings (MEETINGS) or the classroom (CLASS) might limit a faculty member's opportunity to work at home. Open-ended questions were used to measure the amount of time spent in meetings and classes during a typical week. Responses to both items were skewed. Faculty estimated that they spent an average of 4.8 hours per week in meetings (S.D. = 4.78) and almost 5.6 hours per week in the classroom (S.D. = 4.70).

The questionnaire contained five items pertaining to the perceived supportiveness of various reference groups towards faculty members who worked at home. Means and standard deviations for the items are presented as part of Table 16. All ratings were made using a seven-point scale (1 = Strongly Oppose; 4 = Neutral; 7 = Strongly Support). "Other Persons at One's Residence" were perceived, on average, as being the most supportive of home-based work by faculty ($M = 5.27$; $S.D. = 1.41$). "Students" ($M = 3.35$; $S.D. = 1.33$) and the university's "Central Administration" ($M = 3.64$; $S.D. = 1.26$) were perceived to oppose home-based work by faculty members.

Supportiveness ratings for individual reference groups were combined in a Supportiveness scale (SUPPORT). Table 16 presents the inter-item correlations and scale information for this composite. Coefficient alpha for the SUPPORT scale was approximately 0.76. Composite scale scores were computed by summing across the scale items and dividing by five. The mean for the SUPPORT scale was 4.12 ($S.D. = 1.02$).

Table 14

Attractiveness of Home for Work Activities: Descriptive
Results and Intercorrelations

Activity	M	S.D.	Inter-Item Correlations							
			1	2	3	4	5	6	7	8
1. Working (total)	5.13	1.59	-							
2. Meet students	2.39	1.67	24	-						
3. Class prepar.	5.16	1.66	60	22	-					
4. Telephone	4.17	1.65	32	19	38	-				
5. Grading papers	5.79	1.22	52	08	48	40	-			
6. Data analysis	4.64	1.80	37	09	42	18	44	-		
7. Writing	5.73	1.73	62	12	57	25	52	53	-	
8. Reading	5.95	1.32	45	08	42	23	44	39	62	-

Note: Decimals omitted to conserve space.

N = 147

Coefficient α = .81

Scale M: 4.87

Scale S.D.: 1.05

Table 15

Descriptive Results for Single-Item Measures Within
the Opportunity Set

Variable	N	M	S.D.
Opportunity	166	4.17	1.32
Monitor Others	177	3.80	1.55
Hours in meetings/week	181	4.82	4.78
Hours in class/week	177	5.55	4.70

Table 16

Supportiveness of Reference Groups for Faculty Who Work at Home:
Descriptive Results and Intercorrelations

Reference Group	Support Ratings*		Intercorrelations				
	M	S.D.	1	2	3	4	5
1. Program faculty	4.17	1.59	-				
2. Students	3.35	1.33	.44	-			
3. Department/Div.	4.17	1.49	.81	.45	-		
4. Central Admin.	3.64	1.26	.56	.43	.62	-	
5. Others in home	5.27	1.41	.28	.05	.16	.07	-

* Rating Scale: 1 = Strongly Oppose; 4 = Neutral; 7 = Strongly Support

N = 139

Scale M: 4.12

Coefficient α = .76

Scale S.D.: 1.02

Table 17

Intercorrelations Among Variables in the Opportunity Set

Variable	Intercorrelations				
	OPP	MON	MEET	CLSS	SUPP
1. OPPORTUNITY	-				
2. MONITOR	-.19	-			
3. MEETINGS	-.21	.28	-		
4. CLASS	.04	-.10	-.16	-	
5. SUPPORT	.34	-.02	-.13	-.06	-

Intercorrelations Among Variables. Table 17 presents the correlations among the variables comprising the Opportunity Set. Perceived opportunity to work at home was negatively related to the extent to which one was required to monitor the work of others ($r = -.19, p < .01$) and the amount of time spent in meetings during a typical week ($r = -.21, p < .01$). Monitoring of others and time in meetings were positively related ($r = .28, p < .001$). Time in meetings and time in the classroom were negatively associated ($r = -.16, p < .05$). Finally, reference group supportiveness for faculty who worked at home was positively related to the perceived opportunity to work at home ($r = .34, p < .001$).

Home/Office Situational Characteristics

Survey participants were asked to provide information on several variables pertaining to their home and office work environments. The results for these variables are presented as four subsections: (1) availability of separate office space; (2) location of personal computer; (3) others in the home; and (4) commuting situation.

Availability of Separate Office Space. A private office at the university or in the home might be related to the amount of time spent at that site. Most of the faculty responding to the survey had access to a private work space at both locations (see Table 18). Almost all of the participants (93.9%; $N = 168$) reported that they had a private space at the university. Three-quarters of the participants (72.6%; $N = 130$) had some kind of separate office space in their homes. One hundred and twenty-one (67.6%) respondents had access to a separate work space at both locations.

Location of Personal Computer. Access to a personal computer (PC) might be associated with the amount of time that an individual chooses to spend at a given work site. Participants were asked whether they had access to a PC at either their home and/or at the university. Persons indicating shared access to a PC at the university were coded as a response of "No."

Results for the personal computer items are presented in Table 19. Survey participants were slightly more likely to have a personal computer in their home than at the university. Half of those surveyed (52.7% ; N = 96) reported having a personal computer at their office/lab. In comparison, almost two-thirds (63.7%; N = 116) of the sample had a personal computer in their homes. Seventeen percent (N = 31) of the participants did not have a personal computer in either their home or at the university while one-third (N = 61) had a PC at both sites.

Others in the Home. The questionnaire contained several items designed to gather information about other persons at the residence. Faculty were asked to report the number and ages of any children or adolescents currently living at home. Because additional persons might live with the survey participant (e.g., spouse, parents), faculty were also asked to report the total number of persons residing in the household. Results for these items are presented in Table 20.

Table 18

Location with Access to a Private Work Space

		Private Office Space at Office/Lab?			
		No	Yes		
Separate Space in Home?	No	2	47	49	(27.4%)
	Yes	9	121	130	(72.6%)
		11 (6.1%)	168 (93.9%)	N = 179	

Table 19

Location with Access to a Personal Computer

		Personal Computer at Office/Lab?			
		No	Yes		
Personal Computer in Home?	No	31	35	66	(36.3%)
	Yes	55	61	116	(63.7%)
		86 (47.3%)	96 (52.7%)	N = 182	

The faculty who participated in the survey had relatively few children or adolescents living at home ($M = 0.82$; $S.D. = 1.01$). Only 47 of the 183 faculty (25.7%) had two or more children currently residing with them. Ages of "children" ranged from 33 years to 4 months. The average age of the children/adolescents was 11.41 years ($S.D. = 7.13$). The total number of persons in the home also indicated relatively small households ($M = 2.71$; $S.D. = 1.14$).

Commuting Situation. Data was collected on two aspects of the commuting situation (see Table 20). The first aspect was the average amount of time that it took to travel between a faculty member's home and the university (one-way trip). Participants reported spending an average of only 13.5 minutes in traveling between their homes and the university (one-way trip; $S.D. = 7.61$). The number of vehicles available to the occupants of the household was the second aspect of the commuting situation measured as part of the survey. Faculty averaged almost two vehicles per household ($M = 1.96$; $S.D. = 0.69$).

Intercorrelations Among Predictors in Set. Table 21 presents the intercorrelations among the variables included as part of the Home/Office Situational Characteristics set. The relationships among the variables comprising the set were not high or consistently positive. A separate home office was positively correlated with the presence of a home personal computer ($r = .21$, $p < .01$) and negatively related to the number of children ($r = -.26$) in the household. Possibly due to restriction in range, a private work space at the university was not strongly correlated with any of the other variables

Table 20

Descriptive Results for Other Persons in the Household
and Commuting Situation

Variable	N	M	S.D.
No. of Child/Adol in Household	183	0.82	1.01
Average Age of Children	86	11.41	7.13
Number of Persons in Household	183	2.71	1.14
Commuting Time (min.)	182	13.49	7.61
Automobiles in Household	183	1.96	0.69

Table 21

Intercorrelations Among Variables in the Home/Office
Situational Characteristics Set

Variables	Predictor #								
	1	2	3	4	5	6	7	8	9
1. Separ. Home Office	-								
2. Prvt. Univer. Off.	-.05	-							
3. PC in Home	.21	.00	-						
4. PC at University	-.01	.13	.00	-					
5. Number of Children	-.26	.03	.05	.14	-				
6. Aver. Child Age	.13	.15	.06	-.14	-.06	-			
7. Persons in Home	-.15	.02	.11	.16	.91	-.07	-		
8. Commuting Time	-.06	.00	.01	.01	-.09	-.09	-.08	-	
9. Number of Cars	.10	.09	.17	.10	.26	.47	.39	.14	-

Note: Decimals omitted to conserve space.

(i.e., almost all of the faculty had private offices at the university). The total number of persons in the household and the number of children in the household were strongly related ($r = .91$). The number of automobiles in the household was related to the number of children, average age of children, and total number of persons in the household ($r = .26, .47, \& .39, p < .001$, respectively).

Relative Time at Home

Two variables were used to compute the relative amount of time that a faculty member spent working at home during a "typical" week. The first variable was the participant's self-estimate of the total amount of time spent on university-related work during a normal week. The second variable was the individual's estimate of the total amount of time spent working at home during a typical week. "Relative time at home" was computed by dividing the participant's estimate of total time spent working at home by the estimate of total time spent working per week. The value for relative time at home was excluded if the estimate of time at home exceeded total time worked per week (this occurred in only one case).

Table 22 presents descriptive statistics for the measure of relative time at home. Faculty reported that they worked an average of 54.3 hours per week (S.D. = 12.83). The mean amount of time spent working at home was 18.87 hours per week (S.D. = 12.91). Faculty worked at home about 34 percent of the time ($M = 0.34$; S.D. = 0.22).

An item included as part of the Survey Recruitment Letter (SRL) was used to examine the test-retest reliability of the questionnaire estimate of relative time at home. The item asked each participant for a direct estimate of the percent time that they spent on

university-related work while at home during a typical week. The mean for the recruitment letter estimate of "percent time at home" was 26.04% (S.D. = 19.24%; N = 168). The recruitment letter estimate correlated .71 with the computed value from the survey for relative time at home.

In addition to the global items, participants estimated the amount of time spent per week on seven specific work activities. Although not considered in subsequent analyses, results for each of these activities are presented for informational purposes as part of Table 22.

Table 22

Time Spent Working: Overall and Specific Activities

Work Activity	Hours per Week on Activity		Hours on Activity at Home	
	M	S.D.	M	S.D.
Working (total)	54.33*	12.83	18.87*	12.91
Meeting with students	7.41	5.69	0.33	1.62
Class preparation	7.54	5.25	3.70	3.67
On the Telephone	3.94	3.38	0.82	1.32
Grading	4.32	4.70	3.40	6.14
Data analysis	5.44	5.63	2.01	3.26
Writing	9.72	6.68	5.25	5.71
Reading	7.84	5.24	4.81	4.08

Note: Sample size equals 179 to 156

* = Variables used to compute relative time at home.

Correlations Between Predictors and Time at Home

Table 23 presents the correlations between the predictors (arranged within their respective sets) and the criterion (relative time spent working at home by faculty during a "typical" week). Because an "a priori" hypothesis regarding the direction of the relationship between a given predictor and the criterion was not always available, and in order to obtain a more conservative estimate of the number of significant relationships, determination of statistical significance for all relationships was made on the basis of a two-tailed test. Correlational results are discussed for each of the predictor sets. A complete correlation matrix is presented in Appendix F.

Individual Differences

One of the demographic variables (nontenure/tenure track; coded as 0 = nontenure, 1 = tenure track) was significantly correlated with relative time at home ($r = -.18$, $p < .05$). To some extent, persons in nontenure track positions were likely to spend a greater percentage of their work-related time at home. Sex, academic rank, and tenure status exhibited nonsignificant negative correlations with relative time at home ($r = -.14$, $-.06$, and $-.02$, respectively). There was no apparent relationship between age and the criterion ($r = .00$).

Among the personality variables, Need for Achievement had a nonsignificant positive correlation with relative time at home ($r = .10$). Need for Affiliation (NAff) was negatively associated with the criterion ($r = -.25$, $p < .01$), indicating that those with higher affiliation needs tended to spend less relative time working at home. Persons scoring higher on the External Locus of Control measure also

tended to spend relatively less time at the home work site ($r = -.16$, $p < .05$).

Perceived Outcome Effects Composites

Three of the POE composite scales were significantly related to relative time at home. Persons perceiving that working at home had a positive impact on "Interruptions/Distractions" tended to spend more time working in their homes ($r = .43$, $p < .001$). Less relative time at home was related to a perception that working at that site would have a negative impact on "Access" to colleagues and resources ($r = .31$, $p < .001$). Relative time at home was also positively related to the "Effects on Comfort" composite ($r = .32$, $p < .001$). Perceived "Effects on Commuting" and "Effects on Family Situation" were not significantly related to relative time at home among faculty ($r = .11$ & $.16$, NS, respectively).

Attractiveness for Work Activities

Scores for the attractiveness scale were positively correlated with relative time at home ($r = .47$, $p < .001$). Persons rating the home environment as more attractive for work activities tended to also spend relatively greater time at that location.

Opportunity to Work at Home

Three of the five variables within the Opportunity set correlated significantly with the relative amount of time that faculty spent working at home. The single-item measure of perceived opportunity to work at home (OPPORTUNITY) was positively associated with the criterion ($r = .33$, $p < .001$). The extent to which a faculty member

Table 23

Correlations Between Predictors and Relative Time at Home

Predictor	Correlation with Relative Time at Home
Individual Differences	
Demographic Variables	
Sex	-.14
Age	.00
Academic Rank	-.06
Tenure/Nontenure Track	-.18*
Tenure Status	-.02
Personality Variables	
Need for Achievement	.10
Need for Affiliation	-.25**
External Locus of Control	-.16*
Perceived Outcome Effects	
Effects on:	
Interruptions/Distractions	.43***
Access	.31***
Comfort	.32***
Commuting	.11
Family Situation	.16
Attractiveness	
Attractiveness Scale	.47***
Opportunity	
Perceived Opportunity	.33***
Monitoring Others	-.31***
Time in Meetings	-.09
Time in Classroom	.03
Reference Group Supportiveness	.20*
Home/Office Situational Characteristics	
Separate Home Office Space	.23**
Private Office at University	-.14
Personal Computer in Home	.22**
Personal Computer at University	-.24**
Number of Children in Household	-.13
Average Age of Children	.06
Number of Persons in Household	-.14
Time to Travel to University	-.07
Number of Automobiles in Household	-.07

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

Note: Two-tailed significance levels vary due to changes in sample size (N = 79 to 164).

was required to monitor the work of others was negatively related to the relative amount of time worked at home ($r = -.31, p < .001$). In addition, the perception that others in one's reference group supported home-based work was positively related to the relative amount of time that faculty worked at home ($r = .20, p < .05$). The number of hours spent per week in university-related meetings ($r = -.09, NS$) and the number of hours spent per week in the classroom ($r = .03, NS$) were not significantly correlated with the criterion.

Home/Office Situational Characteristics

Three of the nine predictors within the Home/Office Situational Characteristics set were significantly related to time at the home work site. First, relatively greater amounts of time were spent at home by those who had access to a separate office space at that site ($r = .23, p < .01$). Second, the presence of a personal computer in the home was associated with increased time at that location ($r = .22, p < .01$). Third, the absence of exclusive access to a personal computer at the university was associated with relatively greater time at home ($r = -.24, p < .01$).

Presence or absence of a private office at the university was not related to relative time at home ($r = -.14, NS$). Because most of the sample (94%) had access to private office space at the university, it is likely that the observed correlation was attenuated due to restriction in range.

The number of children and/or adolescents in the household was not related to relative time at home within this sample ($r = -.13, NS$). Similarly, the total number of persons in the household exhibited a negative but nonsignificant relationship with the

criterion ($r = -.14$, NS). The average age of children in the household ($r = .06$), the amount of time required to travel to the university ($r = -.07$), and the number of automobiles available in the household ($r = -.07$) were also not significantly related to relative time at home.

Correlational results indicated that a number of the individual variables within the predictor sets were related to the relative amount of time that faculty spent working at home during a "typical" week. A series of regression analyses were conducted to examine the unique contributions of the sets towards prediction of relative time at home.

Regression Analyses

Introduction

Cohen and Cohen (1983) discussed the use of hierarchical regression in exploratory research. Rather than examine the contributions of a large number of individual predictors entered in a sequential manner, Cohen and Cohen (1983) suggested that predictors be entered into a regression equation as "sets." One would then examine the contribution of a predictor "set" towards explanation of unique variance in a criterion prior to inspection of the individual predictors within a given set.

Other things being equal, the power of significance tests in multiple regression tends to decrease as the number of predictors increases (Cohen & Cohen, 1983). To offset this problem, Cohen and Cohen recommended a "less is more" strategy. As part of this strategy, "peripheral" and "redundant" variables are excluded prior to performing regression analyses.

Variables were arbitrarily classified as "redundant" if they had a correlation of .50 or higher with another predictor in the same set. Four of the twenty-eight predictors were classified as being "redundant." Age, Academic Rank, Tenure/Nontenure Track, and Tenure Status (all in the demographic portion of the Individual Differences set) were highly intercorrelated ($r = .583$). Tenure/Nontenure Track was retained for the regression analyses because it was the only one of the four variables that exhibited a significant correlation with relative time at home. Two variables within the Home/Office Situational Characteristics set were also classified as redundant. "Number of children in the home" correlated .91 with "Number of

persons in the household." Because the "number of children" measure was a subset of the "number of persons" measure, the latter variable was retained for the regression analyses.

Initial analyses revealed that two of the remaining predictors were drastically reducing the degrees of freedom available for computing significance tests in the regression analyses. Both variables were part of multiple-predictor sets. The variables were excluded to increase the sample size for the analyses. Exclusion of the "Effects on Family Situation" composite (coefficient alpha = .48) as part of the Outcome composites set increased the available sample size for the regression analyses investigating Hypothesis 1 and Hypothesis 3 by over 50% (e.g., from 74 to 117 in the regression analyses for Hypothesis 1). Similarly, exclusion of the "Average Age of Children/Adolescents" measure (part of the Home/Office Situational Characteristics set) increased the minimum sample size for the regression analyses investigating Hypothesis 2 from 68 to 117.

Description of the regression analyses is based on the general hypotheses for the study. The "Adapted" model suggested that two of the predictor sets (Individual Differences & Perceived Outcome Effect Composites) were the immediate antecedents of the perceived attractiveness of the home for work activities (Hypothesis 1). Three of the predictor sets (Attractiveness, Opportunity, & Home/Office Situational Characteristics) were expected to uniquely account for variance in the measure of relative time at the home work site (Hypothesis 2). Finally, the model suggested that the perceived attractiveness of the home for work activities mediated the relationship between the "indirect predictors" (Individual Differences

& Perceived Outcome Effect Composites) and relative time at home (Hypothesis 3).

Results of Regression Analyses

Hypothesis 1. The first hypothesis focused on prediction of the perceived attractiveness of the home for work activities. Individual Differences (split into "Demographic" and "Personality" sets) and the Perceived Outcome Effect composites were thought to uniquely account for variance in the Attractiveness measure. Regression analyses were used to investigate the relation between the Outcome composites (excluding the "Effects on Family Situation" composite), the Individual Differences sets, and Attractiveness.

Results of the hierarchical regression analyses for the first hypothesis are presented in Table 24. Additional regression information (e.g., beta weights for individual predictors) is presented in Appendix G. Although the F for the overall regression equation was significant ($F = 12.31, p < .001$), the first hypothesis was fully supported for only the Perceived Outcome Effects composites. After both Individual Differences sets (Demographic and Personality) had been entered into the regression equation, the Perceived Outcome Effects composites uniquely accounted for over 36% of the variance in the Attractiveness measure (F for change in $R^2 = 19.66, p < .001$). Within the Outcomes set, the "Effects on Interruptions/Distractions" composite was the single best predictor of Attractiveness (beta = .452, $F = 30.46, p < .001$). The weights for the "Effects on

Table 24

Hierarchical Regression Analyses for Attractiveness

Model	Order of Entry	Set	R	R ²	ΔR^2	Change F	Sign. of Change
A	1	Ind. Diff. - Pers.	.218	.048	.048	1.88	NS
	2	Ind. Diff. - Demo.	.384	.148	.100	6.51	.002
	3	Outcome Composites	.713	.509	.361	19.66	.001
B	1	Ind. Diff. - Demo.	.300	.090	.090	5.63	.005
	2	Ind. Diff. - Pers.	.384	.148	.058	2.50	.06
	3	Outcome Composites	.713	.509	.361	19.66	.001
C	1	Outcome Composites	.689	.475	.475	25.37	.001
	2	Ind. Diff. - Demo.	.696	.484	.009	0.94	NS
	3	Ind. Diff. - Pers.	.713	.509	.025	1.78	NS
D	1	Outcome Composites	.689	.475	.475	25.37	.001
	2	Ind. Diff. - Pers.	.704	.496	.021	1.50	NS
	3	Ind. Diff. - Demo.	.713	.509	.013	1.35	NS

Dependent variable: Attractiveness of home for work activities

Note: Beta weights for overall regression equation are presented in Appendix G

Access" (beta = .167, $F = 4.23$, $p < .04$) and "Effects on Comfort" (beta = .165, $F = 4.64$, $p < .03$) composites were also significant.

The contributions of the Individual Differences sets to the explanation of variance in the Attractiveness measure were somewhat less supportive of Hypothesis 1. The Individual Differences - Demographic set accounted for a significant amount of variance in the attractiveness of the home as a work site prior to the entry of the Outcome composites set (see Model A in Table 24; F for change in $R^2 = 6.51$, $p < .002$). However, following entry of the Outcome composites into the regression equation, the contribution of the

Demographic set to the explanation of additional variance in the Attractiveness measure was not significant (e.g., see Model C in Table 24; $\Delta R^2 = .009$, $F = 0.94$, NS). In the overall regression equation, the beta weight for Sex ($\beta = -.123$, $F = 2.45$, $p < .12$) approached significance.

The Individual Differences - Personality set did not account for significant amounts of variance in the Attractiveness measure when the set was entered as the first step in the regression analysis (Model A; $\Delta R^2 = .048$, $F = 1.88$, NS) or after entry of the Outcome composites set (e.g., Model D; $\Delta R^2 = .021$, $F = 1.50$, NS). However, the Personality set accounted for almost 6% of the variance in the Attractiveness measure after controlling for demographic differences in the sample (Model B, $\Delta R^2 = .058$, $F = 2.50$, $p < .06$). The beta weight of Need for Achievement ($\beta = .140$, $F = 3.85$, $p < .052$) approached significance in the overall regression equation.

Hypothesis 2. The second hypothesis was that the Attractiveness, Opportunity, and Home/Office Situational Characteristics sets would uniquely contribute to the explanation of variance in the relative amount of time that faculty spent working at home. To examine their unique contributions towards prediction of the criterion, Models "A", "B" and "C" in Table 25 present the results of the analyses when the Home/Office Situational Characteristics, Attractiveness, and Opportunity sets, respectively, were entered as the final set in the hierarchical regression equation. Appendix G presents the beta weights and other information for the overall regression equation.

Results of the regression analyses supported the second hypothesis for two of the three predictor sets. The amount of

variance accounted for by the overall regression equation was significant ($F = 5.78, p < .001$). Examination of the values for change in R suggests that the Attractiveness and Opportunity sets both uniquely contributed to the prediction of relative time at home.

Table 25

Hierarchical Regression Analyses for Relative Time at Home

Model	Order of Entry	Set	R	R^2	ΔR^2	Change F	Sign. of Change
A	1	Attractiveness	.468	.219	.219	32.34	.001
	2	Opportunity	.605	.366	.147	5.08	.001
	3	Home/Office Sit.	.649	.422	.056	1.42	NS
B	1	Home/Office Sit.	.407	.166	.166	3.10	.005
	2	Opportunity	.564	.318	.152	4.63	.001
	3	Attractiveness	.649	.422	.104	18.48	.001
C	1	Home/Office Sit.	.407	.166	.166	3.10	.005
	2	Attractiveness	.537	.288	.122	18.58	.001
	3	Opportunity	.649	.422	.133	4.75	.001

Dependent variable: Relative time spent working at home

Note: Beta weights for overall regression equation are presented in Appendix G

In Model B, entry of the Attractiveness measure as the final step in the regression resulted in a significant change in the amount of explained variance in the criterion ($F = 18.48, p < .001$). Controlling for variance explained by the other two sets, the Attractiveness measure uniquely accounted for 10% of the variance in the measure of relative time at home ($\Delta R^2 = .104$). The weight for

the Attractiveness measure in the overall regression equation was also significant ($\beta = .370$, $F = 18.48$, $p < .001$).

Results for Model C indicate that the Opportunity set also uniquely contributed to prediction of relative time at home ($\Delta R^2 = .133$, $F = 4.75$, $p < .001$). In the overall regression equation, the beta weights for the extent to which a faculty member was required to monitor the work of others ($\beta = -.286$, $F = 12.33$, $p < .001$) and the perceived opportunity to work at home ($\beta = .216$, $F = 6.49$, $p < .012$) were significant.

The Home/Office Situational Characteristics set did not account for a significant amount of unique variance in the measure of relative time at home (Model A, $\Delta R^2 = .056$, $F = 1.42$, NS). However, the Home/Office Situational Characteristics set did account for a significant amount of variance (common and unique) in the criterion when it was entered as the first step in the regression equation (Models B & C, $\Delta R^2 = .166$, $F = 3.10$, $p < .005$). In the overall regression equation, the beta weights for "Access to a Personal Computer at Home" ($\beta = .157$, $F = 3.70$, $p < .06$) and "Access to a Personal Computer at the University" ($\beta = -.130$, $F = 2.77$, $p < .10$) approached significance.

Hypothesis 3. Consistent with the model presented in Figure 2, the attractiveness of the home for work activities (Attractiveness) was hypothesized to mediate the relationship between the "indirect" predictors (i.e., Individual Differences & Perceived Outcome Effects composites) and relative time at the home work site. A two stage process was used to examine this hypothesis. In the first stage, the "indirect" predictors were entered into a regression equation with

relative time at the home work site as the criterion. In the second stage of the analyses, the significant "indirect" predictors from Stage 1 (i.e., the sets accounting for a significant amount of unique variance in the criterion) and the Attractiveness measure were entered into regression analyses to examine their proportionate contributions to the prediction of relative time at the home work site.

Table 26 presents the results from the first stage of the analyses (see also Appendix G). The Outcome composites set and the Individual Differences - Personality set each accounted for a significant amount of unique variance in the measure of relative time at home. The Outcome composites uniquely accounted for almost 18% of the variance in the criterion (Model B, $\Delta R^2 = .178$, $F = 7.22$, $p < .001$). Over 5% of the variance in the criterion was uniquely accounted for by the Individual Differences - Personality set (Model C, $\Delta R^2 = .053$, $F = 2.89$, $p < .04$). The Demographics set did not account for a significant amount of unique variance in the criterion (Model A, $\Delta R^2 = .016$, $F = 1.31$, NS). The contribution of the Demographics set to the explanation of variance in the measure of relative time at home was also not significant when the set was entered as the first step in the regression analysis (Model B, $\Delta R^2 = .039$, $F = 2.48$, NS).

Table 26

Stage 1 of Regression Analyses for Hypothesis 3

Model	Order of Entry	Set	R	R ²	ΔR^2	Change F	Sign. of Change
A	1	Outcome Composites	.476	.227	.227	8.81	.001
	2	Ind. Diff. - Pers.	.526	.277	.050	2.68	.05
	3	Ind. Diff. - Demo.	.541	.293	.016	1.31	NS
B	1	Ind. Diff. - Demo.	.198	.039	.039	2.48	.09
	2	Ind. Diff. - Pers.	.339	.115	.076	3.41	.02
	3	Outcome Composites	.541	.293	.178	7.22	.001
C	1	Ind. Diff. - Demo.	.198	.039	.039	2.48	.09
	2	Outcome Composites	.489	.240	.200	7.77	.001
	3	Ind. Diff. - Pers.	.541	.293	.053	2.89	.04

Dependent variable: Relative time spent working at home

Note: Beta weights for overall regression equation are presented in Appendix G

The Individual Differences - Personality and Outcome composite sets were retained for the second phase of the analyses, in which the relative contributions of the "indirect" predictors and Attractiveness were assessed. The basic issue in the second stage of the analyses was whether Attractiveness both summarized the contributions of the "indirect" predictors and accounted for additional unique variance in predicting the amount of time that faculty spent working at home.

Table 27

Stage 2 of Regression Analyses for Hypothesis 3

Model	Order of Entry	Set	R	R ²	ΔR^2	Change F	Sign. of Change
A	1	Ind. Diff. - Pers.	.267	.072	.072	2.90	.04
	2	Outcome Composites	.526	.277	.205	7.73	.001
	3	Attractiveness	.553	.306	.030	4.60	.03
B	1	Attractiveness	.468	.219	.219	32.34	.001
	2	Ind. Diff. - Pers.	.510	.260	.040	2.04	.11
	3	Outcome Composites	.553	.306	.046	1.81	.13
C	1	Attractiveness	.468	.219	.219	32.34	.001
	2	Outcome Composites	.515	.265	.045	1.71	.15
	3	Ind. Diff. - Pers.	.553	.306	.041	2.15	.10

Dependent variable: Relative time spent working at home

Note: Beta weights for overall regression equation are presented in Appendix G

Table 27 presents the results for the second phase of the analyses. Beta weights for individual predictors and other information pertaining to the overall regression equation are presented in Appendix G. The results support the third hypothesis. After the Individual Differences - Personality and Outcome composite sets were entered into the regression equation, the Attractiveness variable accounted for a small but significant amount of unique variance in the measure of relative time at home (Model A, $\Delta R^2 = .03$, $F = 4.60$, $p < .03$). Results for Models B and C in Table 27 indicate that the Outcome composites ($\Delta R^2 = .046$, $F = 1.81$, $p < .13$) and the Individual Differences - Personality set ($\Delta R^2 = .041$, $F = 2.15$, $p < .10$) did not account for significant amounts of unique variance in the criterion after Attractiveness had entered the regression equation

(although the beta weight for Need for Affiliation was significant in the overall regression equation; $\beta = -.196$, $F = 4.57$, $p < .03$).

Summary of Regression Results. The general hypotheses developed on the basis of the "adapted" model (Figure 2) were partially supported by the results of the regression analyses. The Outcome composites were found to account for a significant amount of unique variance in the Attractiveness measure, which, in turn, appeared to mediate the relationship between the Outcome composites and relative time at the home work site. The Opportunity set accounted for additional unique variance in the measure of relative time at home.

The Individual Differences sets (Demographic and Personality) accounted for significant or near significant amounts of variance in the Attractiveness measure prior to the entry of the Outcome composites into the regression analyses. However, the contribution of the Demographic and Personality sets to the explanation of additional variance in Attractiveness beyond that accounted for by the Outcome composites was not significant. The Individual Differences - Personality set also contributed to the explanation of variance in the measure of relative time at home. The amount of unique variance accounted for by the Personality set was not significant after the entry of the Attractiveness measure into the regression equation.

Finally, the Home/Office Situational Characteristics set contributed to the explanation of variance in the measure of relative time at home. However, the Home/Office Situational Characteristics set failed to account for a significant amount of unique variance in this criterion if it was entered into the regression equation after the Opportunity set and the Attractiveness measure.

Post Hoc Analyses

Introduction. Post hoc regression analyses were conducted in an attempt to further explore the relationships among the predictor sets. One set of analyses focused on a "simplified" model to predict the relative amount of time that faculty spent working at home. A second set of analyses investigated alternative arrangements of the predictor sets from the "adapted" model.

"Simplified" Model. By focusing on only the sets that were found to make a unique contribution to the prediction of a given criterion (e.g., Attractiveness or relative time at home), it was possible to simplify the model from Figure 2. This "simplified" model is presented in Figure 4. Post hoc analyses were conducted to examine the utility of the "simplified" model for predicting the relative amount of time that faculty spent working at home.

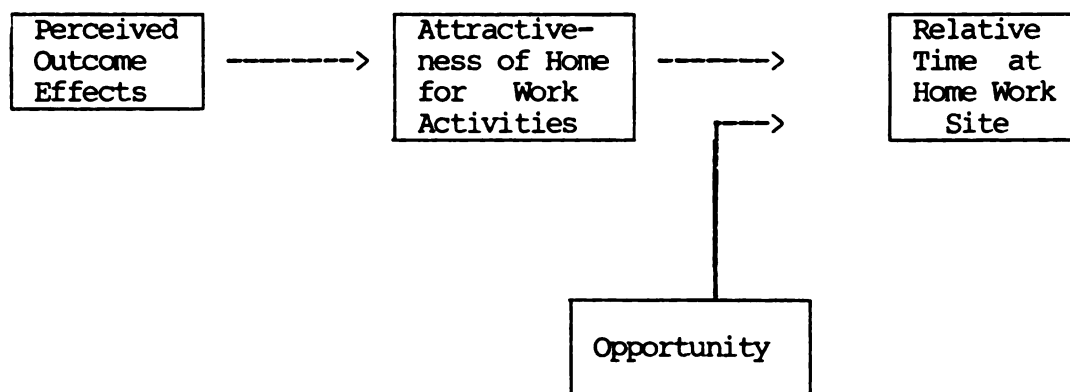


Figure 4. A "simplified" model to predict relative time at the home work site

The results for the regression analyses examining the "simplified" model are presented in Table 28. Beta weights and other information for the overall regression equation are presented in Appendix G. The amount of variance explained by the overall regression equation was significant ($F = 6.01, p < .001$). The "simplified" model accounted for over 38% of the variance in the measure of relative time at home.

The unique contribution of the Outcome composites toward the explanation of variance in the criterion was not significant (Model A, $F = 0.74, NS$). However, when entered as the first step in the hierarchical regression equation, the Outcome composites accounted for 22.7% of the criterion variance (e.g., see Model B).

The Opportunity and Attractiveness sets both accounted for significant amounts of unique variance in the measure of relative time at home. The Opportunity set accounted for 12% ($F = 3.75, p < .004$) of the unique variance in the criterion measure (Model B). The Attractiveness measure uniquely explained 5% of the criterion variance (Model C, $F = 7.78, p < .007$).

Additional Post Hoc Analyses. The a priori regression analyses suggested that the Individual Differences (Demographic & Personality) sets did not predict significant amounts of additional variance in the measure of Attractiveness after controlling for the contribution of the Outcome composites. Similarly, the Home/Office Situational Characteristics set did not account for additional variance in the measure of relative time at home after the Attractiveness measure and the Opportunity set had entered into the regression equation. Post hoc regression analyses were conducted to explore the utility of

Table 28

Regression Analyses for the "Simplified" Model

Model	Order of Entry	Set	R	R ²	ΔR^2	Change of F	Sign. of Change
A	1	Attractiveness	.468	.219	.219	29.52	.001
	2	Opportunity set	.605	.366	.147	4.62	.001
	3	Outcome composites	.620	.385	.019	0.74	NS
B	1	Outcome composites	.476	.227	.227	7.49	.001
	2	Attractiveness	.515	.265	.038	5.20	.02
	3	Opportunity set	.620	.385	.120	3.75	.004
C	1	Outcome composites	.476	.227	.227	7.49	.001
	2	Opportunity set	.579	.335	.108	3.16	.01
	3	Attractiveness	.620	.385	.050	7.78	.007

Dependent variable: Relative time spent working at home.

Note: Beta weights for overall regression equation are presented in Appendix G

Table 29

Regression Analyses for the Outcomes Index

Model	Order of Entry	Set	R	R ²	ΔR^2	Change of F	Sign. of Change
A	1	Ind. Diff. - Demo.	.294	.087	.087	5.55	.005
	2	Ind. Diff. - Pers.	.322	.104	.017	0.73	NS
	3	Home/Office Sit.	.517	.268	.164	3.42	.003
B	1	Home/Office Sit.	.460	.212	.212	4.29	.001
	2	Ind. Diff. - Pers.	.462	.214	.002	0.10	NS
	3	Ind. Diff. - Demo.	.517	.268	.054	3.95	.02
C	1	Home/Office Sit.	.460	.212	.212	4.29	.001
	2	Ind. Diff. - Demo.	.514	.264	.052	3.90	.02
	3	Ind. Diff. - Pers.	.517	.268	.004	0.19	NS

Dependent variable: Combined Outcome composites

Note: Beta weights for overall regression equation are presented in Appendix G

including these sets as predictors of the outcomes that faculty associated with working at home. Scale scores on the four remaining Outcome composites were summed to form an "Outcome Index", which served as the criterion for the regression analyses. The results of the analyses are presented in Table 29 (see also Appendix G).

Results from the hierarchical regression analyses suggest that the Home/Office Situational Characteristics set ($\Delta R^2 = .164$, $F = 3.42$, $p < .003$) and the Demographic characteristics set ($\Delta R^2 = .054$, $F = 3.95$, $p < .02$) both uniquely contributed to the explanation of variance in the Outcome index. Individual predictors with significant beta weights included sex ($\beta = -.255$, $F = 7.48$, $p < .007$), access to a separate office space in the home ($\beta = .192$, $F = 4.55$, $p < .04$), the number of persons residing in the household ($\beta = -.230$, $F = 5.85$, $p < .02$), and the average amount of time required to travel to the university ($\beta = .232$, $F = 6.73$, $p < .01$). The Individual Differences - Personality set did not significantly contribute to the prediction of scores on the Outcome index when entered as the last set in the regression analysis ($\Delta R^2 = .004$, $F = 0.19$, NS).

The main regression analyses indicated that the Attractiveness measure and the Opportunity set both accounted for significant amounts of unique variance in terms of the relative amount of time that faculty spent working at home. The issue of whether the opportunity to work at home moderated the relationship between Attractiveness and relative time at home was explored in a final set of post hoc regression analyses.

Moderated regression analysis (Ghiselli, Campbell, & Zedeck, 1981) was used to investigate the relationship between the Opportunity set, Attractiveness, and relative time at the home work site. Three variables (time in meetings, time in classroom, & reference group supportiveness) were removed from the Opportunity set to reduce the number of predictors and interaction terms in the regression equation and to increase the amount of available statistical power. All three variables had previously been found to have non-significant beta weights (in this sample) for predicting relative time at home. The perceived opportunity to work at home (Opportunity) and the extent to which one was required to monitor the work of others (Monitor) were retained for the analyses.

The cross-products of the Opportunity measures and Attractiveness were computed and entered as the final step in a regression analysis with relative time at home as the criterion. Results of the regression analysis did not support the presence of a moderator variable. The interaction term between Attractiveness and Opportunity failed to meet minimal system tolerance standards for inclusion in the regression equation. The change in R from inclusion of the interaction term between Attractiveness and Monitor was not significant ($\Delta R^2 = .00$, $F = 0.04$, NS).

Discussion

Introduction

A number of topics pertaining to the present study and research on home-based work are discussed. The section begins with a review of the general objectives of the study. The objectives are followed by a brief summary of the primary and post hoc regression results and the presentation of a "revised" model. A discussion of the limitations of the study is followed by a section outlining its potential implications. The paper concludes with suggestions for future research.

General Objectives of the Study

Home-based work is expected to grow both within and outside of organizations in the future (Garr, 1984). Organizational interest in home-based work has focused on information-oriented clerical (e.g., Geisler, 1985) and professional jobs (e.g., McDavid, 1985). Organizations are expected to increase the informal use of a "flexiplace" option whereby those in higher-level occupations are conditionally allowed to control their time at a given work site (Olson & Primps, 1984; Shamir & Salomon, 1985). Recent research on home-based work has focused on the job-related outcomes (e.g., performance, satisfaction) associated with telecommuting (Manning,

1985; Phelps, 1985). Many of these reports have been non-empirical (e.g., Brophy, 1985; Garr, 1984).

The present study had three general objectives in relation to previous research. One objective was to expand the study of home-based work beyond an exclusive focus on the effects of telecommuting. It is not necessary to use a computer to work at home. Research involving home-based work, therefore, should not be limited to those who must utilize computers in order to perform their work activities.

A second general objective was to explore predictors (rather than outcomes) of some aspect of home-based work. Because an individual may have control over the amount of time spent at a given work location as part of a "flexiplace" option, the present study focused on predictors of the relative overall amount of time that faculty spent working at home.

A third general objective of the study was to empirically (rather than anecdotally) examine the relationship between the predictor variables and the criterion. While the formation of causal conclusions from an exploratory study may not be appropriate (Cohen & Cohen, 1983), it was hoped that empirical results would allow for the development of stronger hypotheses in future studies.

Results of Regression Analyses

The general hypotheses developed from the "adapted" model (Figure 2) guided the primary set of regression analyses. Post hoc regression analyses were conducted to explore alternative models for predicting relative time at the home work site.

The first series of regression analyses examined the extent to which three sets of predictors (Perceived Outcome Effects Composites, Individual Differences - Demographic, Individual Differences - Personality) were related to the perceived attractiveness of the home as a work site. The Outcome composites were found to uniquely account for significant amounts of variance in the Attractiveness measure. Within the Outcomes set, the perceived effects of working at home on Interruptions/Distractions, Access, and Comfort were found to be significant predictors of the attractiveness of the home for work activities. Prior to the entry of the Outcome composites set into the regression equation, the Individual Differences sets (Demographic & Personality) were found to account for significant or near significant amounts of variance in the Attractiveness measure.

Three sets of predictors (Attractiveness, Opportunity, & Home/Office Situational Characteristics) that had been conceptualized as "direct" predictors of relative time at the home work site were entered into the second series of regression analyses. In partial support of the second hypothesis, the Attractiveness scale and the Opportunity set were found to account for significant amounts of unique variance in the criterion. In addition to the Attractiveness measure, the extent to which a faculty member was required to monitor the work of others and the perceived opportunity to work at home appeared to be the most important "direct" predictors of relative time at the home work site. The Home/Office Situational Characteristic set did not account for a significant amount of unique variance in the relative time at home criterion.

The third hypothesis was based on the notion that the perceived attractiveness of the home as a work site mediated the relationship between the "indirect" predictors (Individual Differences - Demographic, Individual Differences - Personality, & the Outcome composites) and relative time at home. Among the "indirect" predictors, the Outcome composites and the Personality set were found to account for significant amounts of variance in the measure of relative time at home. When the Attractiveness measure was introduced as the first step in the hierarchical regression, the unique contributions of the Personality and Outcome composite sets to the explanation of variance in the criterion were no longer significant. In contrast, the Attractiveness measure did account for a significant amount of unique variance in the measure of relative time at home when entered as the last step in the regression analysis. The results provided support for the hypothesis that the attractiveness of the home for work activities mediates the relationship between the "indirect" predictors and relative time at home.

The results from the primary series of regression analyses failed to fully support the structure of the "adapted" model as presented in Figure 2. Based on the results from the previous analyses, a "simplified" model (see Figure 4) was developed and tested. The model included the Outcome composites, Attractiveness, and the Opportunity set as predictors. The "simplified" model accounted for over 38% of the variance in the measure of relative time at home. Attractiveness and the Opportunity set were found to account for significant amounts of unique variance in the criterion.

Post hoc regression analyses were also used to examine the merits of alternative linkages for the "non-significant" predictor sets. The Home/Office Situational Characteristics set and the Individual Differences sets had not been found to account for significant amounts of unique variance in terms of relative time at home. These sets (along with the Individual Differences - Personality set) were examined as possible antecedents of the outcomes associated with home-based work. An "Outcomes Index" was created by summing the scores for the four Outcome composites. Using the Outcomes Index as the criterion, regression analyses tended to support the placement of the Home/Office Situational Characteristics and Individual Differences - Demographic sets as predictors of the outcomes associated with home-based work. The Individual Differences - Personality set did not account for a significant amount of variance in the Outcomes Index.

A final post hoc regression analysis attempted to investigate the possibility that the opportunity to work at home moderated the relationship between the attractiveness of the home for work activity and relative time at that site. Results did not support the use of "Opportunity" as a moderator variable.

The findings from the primary and post hoc regression analyses suggest the possibility of a "revised" model to predict the relative amount of time that faculty spend working at home. Such a model is presented in Figure 5. Briefly, the model proposes that characteristics of the individual and of the home/office environment(s) predict the outcomes that one is likely to associate with working at home (e.g., the presence of other persons in the household may result in a perception of being frequently interrupted

while trying to work at home). In turn, the outcomes associated with home-based work may influence the overall perceived attractiveness of the home for work activity (e.g., frequent interruptions may be associated

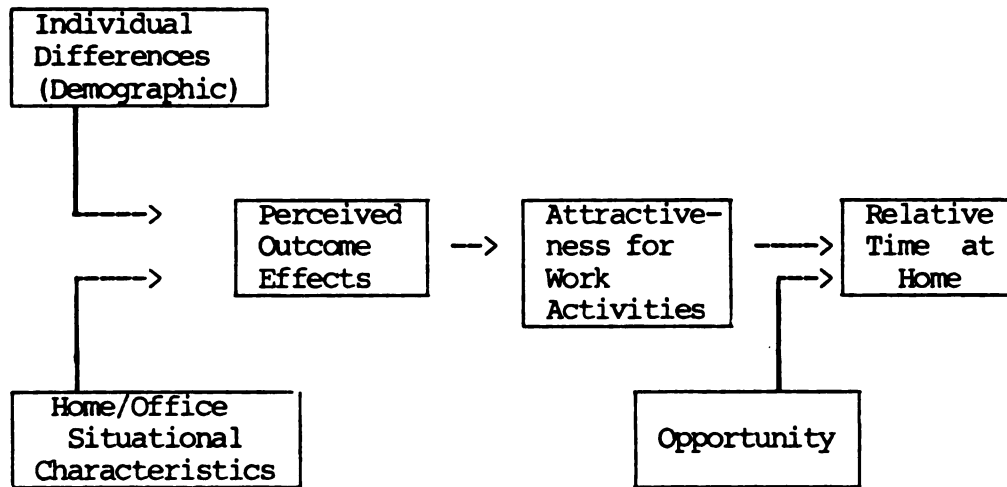


Figure 5. A "revised" model to predict relative time at the home work site

with a perception of the home as a less attractive work site). Finally, the attractiveness of the home work site and the extent to which a faculty member has the opportunity to work at home act as "direct" predictors of the relative amount of time spent working at home.

The placement of the Individual Differences - Personality set in the "revised" model is unclear. The Personality set did not account for a significant amount of variance in the Outcomes Index and accounted for only a marginal amount of variance in the Attractiveness

measure. However, Attractiveness did appear to mediate the relationship between the Personality set and relative time at the home work site. Additional research may help to clarify the linkages between personality and relative time at home.

Limitations of the Study

There were a number of potential problems with the present study. Concern over the accuracy of the survey measures and the methods used to gather the data were two apparent limitations.

Concerns with Measures

Where possible, previously validated scales were used to measure the variables of interest (e.g., Need for Achievement, Need for Affiliation, & External Locus of Control). For several variables, however, it was necessary to develop new measures (e.g., Perceived Outcome Effects, Attractiveness of the Home for Work Activities, & Relative Time at Home). Because of the lack of prior research involving these scales, it is not certain that they were necessarily accurate or valid.

The Perceived Outcome Effects (POE) items were based on concepts from expectancy theory. In expectancy research the perceived desirability and likelihood of outcomes are usually measured separately (Campbell & Pritchard, 1976). In contrast, the POE measure combined two components (perceived effect and desirability) within a single rating scale. The POE scale was also dissimilar in that respondents were asked to rate the perceived effect (strong, weak, or no effect) of an action (working at home) on a given outcome (e.g., time with family) rather than estimate the likelihood that a given outcome would or would not occur. Several participants commented that

they found the POE rating scale and its accompanying instructions to be unclear and confusing (though some respondents used stronger language). This apparent confusion occurred despite several revisions of the scale anchors and the instructions. It is less likely that participants responded appropriately if they were unable to decipher the rating scale for the POE items.

Low internal consistency among several of the Outcome composites may have served to attenuate the size of their relationship with other variables in the study. For example, the size of the correlation between the Effects on Comfort composite and relative time at home may have been reduced because of low internal consistency in the composite (coefficient alpha = 0.51).

Questions about the criterion measure come from two sources: (1) potential instability in the attribute being measured; and (2) concern about the accuracy of self-estimates regarding time. Several participants informally commented that the amount of time they spent working at home varied greatly during the course of an academic term. They described their responses regarding the amount of time spent at home during a "typical" week as rough estimates. In addition, while the survey and recruitment letter estimates of relative time at home were consistent ($r = .71$), both values were based on self-estimates. It is not known to what degree these self-estimates reflected reality.

Method of Data Collection

It is likely that the findings of the study were distorted to some degree by the methods used to collect the data. Many of the predictors and the criterion measure were based on perceptions. In general, more "objective" variables (e.g., sex, number of children,

number of cars in the household) tended to have lower correlations with perceived time at home than did predictors that were based on perceptions (e.g., Attractiveness scale, Interruptions/Distractions composite). The size of the observed predictor-criterion correlations may have been inflated as a result of this common method variance (i.e., the "percept-percept" problem; Roberts & Glick, 1981). In addition, all of the data (excluding the estimate of relative time at home measured as part of the Survey Recruitment Letter) was collected concurrently as part of the same questionnaire and this too may have inflated the size of the observed correlations.

Implications of the Study

The results of the study have a number of implications for the area of home-based work. These implications should be treated with some degree of caution because they are based on the results of a single exploratory study and a model (Figure 5) that was partially developed from post hoc analyses.

The Home/Office Situational Characteristics set did not account for a significant amount of unique variance in the measure of relative time at home in the initial regression analyses. However, post hoc analyses for the "revised" model suggest that the characteristics of the home environment may influence the outcomes that an individual associates with home-based work. For example, the age of and number of children in the household (excluded from the reported regression analyses) may affect the number of anticipated interruptions and distractions at the home work site (e.g., younger children have been associated with more frequent interruptions; Christensen, 1985). Inclusion of situational characteristics as antecedents of the

outcomes associated with home-based work might allow researchers and others to "target" certain situational characteristics when attempting to predict given outcome categories. To illustrate, one might specifically examine time required to travel to a central office when attempting to predict the perceived effect of working at home on commuter costs. Similarly, the number of children in the household might be expected to predict the perceived effect of working at home on participation in family roles, but may not be expected to influence perceptions concerning access to professional resources.

Post hoc analyses suggested that a worker's sex might also influence the outcomes that are associated with home-based work. This finding is consistent with previous research indicating that males and females tend to work at home for different reasons (e.g., Olson, 1983; Olson & Primps, 1984). For the current sample, male faculty members tended to perceive working at home as having a less positive effect on the given outcomes than did female faculty.

The study supported the notion that the outcomes an individual associates with home-based work indirectly predict the amount of time that he or she is likely to spend working at home (Brief, 1985). Results from the regression analyses suggest that the relationship between the outcomes associated with home-based work and time at the home work site is mediated by the perceived attractiveness of the home for work activities.

Taken as a whole, the "revised" model suggests that: (1) changes in situational characteristics (e.g., birth of a new child) and/or demographic characteristics may affect the outcomes that one associates with home-based work and thereby influence the

attractiveness of the home as a work site; and (2) even if given the opportunity, a worker may not choose to work at home if that site has come to be associated with negative outcomes (e.g., increased interruptions, decreased performance, decreased pay, decreased opportunity for advancement). These findings, in turn, suggest that an organization interested in the development and maintenance of a long-term home-based worker program should take care to ensure that home-based work does not come to be perceived as somehow "penalizing" the employee.

Future Research

Clarification of the measures used in the present study represents one direction for future research. Identification of additional predictors and replication of the findings in other populations represents another area for future study.

Clarification of Measures

On the predictor side, development of scales to more directly measure the underlying constructs tapped by the Outcome composites may be warranted. At a minimum, revision of the anchors for the Outcomes rating scale and clarification of the instructions is needed. Comparison of perceived and actual effects of working at home on these outcomes might help to validate the results from the Outcome ratings. For example, working at home was perceived to generally have a positive impact on the number of experienced interruptions and distractions. Future research might explore the question of whether persons are actually interrupted less often at home when compared with the office.

On the criterion side, research is needed to determine the accuracy of the self-estimates of the amount of time spent working during a "typical" week. Having peers and subordinates report the number of hours that an individual was at the office during a given week might be one alternative method for estimating the extent of home-based work. Secretaries or spouses might record the amount of time at home. Faculty might keep daily logs of the amount of time at the home work site and the activities performed. While all of these methods are potentially flawed, they do represent alternative methods for measuring relative time at home.

The results of the pilot interviews suggested that the characteristics of the home environment may influence the nature of the work activities performed in the home. For example, the presence of small children may not affect the relative amount of time spent at the home work site, but may influence whether one spends the time at home reading memos or writing manuscripts. A future study might examine prediction of time spent on specific work activities rather than using a global estimate of work-related time at home.

Finally, several survey participants suggested a possible distinction between those who work at home "in-place-of" time at another site and those who work at home "in-addition-to" time at another site. Future studies might investigate the implications of this distinction for prediction of work-related time at home.

Extension of Findings

The implication of the present study is that it is possible to identify variables predicting the extent to which a university faculty member is likely to work at home. Future expansion on these findings

might focus on: (1) identification and investigation of additional predictors of work-related time at home; and (2) replication of findings using other populations.

A number of additional variables may predict the amount of time that an individual is likely to spend working at home. Poor physical health might require that an employee work more frequently at home. A desire to avoid the overt supervision and control of the office environment might lead to greater time in the perceived autonomy of the home environment. Physical conditions in the office (e.g., amount of cigarette smoke) or relations with coworkers might also affect the amount of time that an employee spends working at home. One might compare the outcomes associated with the central office site to those associated with home-based work in predicting the decision to work at home. Additional outcomes (e.g., impact of working at home on pay and benefits for clerical workers) might also be identified. In short, the variables included as part of the present study were not exhaustive. Future research might reveal additional predictors of the relative amount of time that an individual chooses to spend working in the home environment.

The current study utilized a group of university faculty. The extent to which the predictors identified with a sample of faculty based at a "rural" university will generalize to other samples or populations is an empirical question and needs to be tested. For example, future research might examine the impact of the location of the university (e.g., urban or rural) on the amount of time spent at the home work site. Another study might compare the outcomes associated with home-based work for clerical workers to higher-level

personnel to determine whether similar variables predict home-based work. Clearly, additional studies involving different samples and populations are necessary to develop a more sophisticated understanding of the decision to work at home. In addition, the "revised" model was developed on the basis of post hoc analyses. Despite its intuitive appeal, replication of support for the model in an independent study is necessary.

While the present study focused on predictors, the organizational and individual consequences of home-based work also need to be more closely examined. The impact of home-based work on such outcomes as performance, job satisfaction, organizational commitment, turnover, recruiting, and careers may be critical to future organizational acceptance of work-at-home programs. Potential links between the antecedents and consequences of home-based work also need to be explored.

Conclusion

Despite its antiquity, empirical research into home-based work is relatively recent (Shamir & Salomon, 1985; Swartz, 1986). Although future applications of home-based work at the clerical level may be restricted by legal, union, safety, and compensation issues (Elisburg, 1985), informal use of flexiplace for salaried, higher-level employees is expected to increase (Garr, 1984; Olson & Primps, 1984). As home-based work becomes more wide-spread within organizations, the relationship of the individual to the "workplace" and the organization may be altered. The findings of the present study provide a small step towards increased understanding of some of the variables associated with this altered relationship.

APPENDICES

APPENDIX A

Results from Faculty Interviews

Appendix A

Results from Faculty Interviews

L. T. Interviewed: Wednesday, 2/5/86, 3:00 PM

1. Would you briefly describe for me both the positive and negative outcomes that you associate with the idea of working at home?

Positive outcomes:

- A. Not being alone in a dark (office) building after traditional work hours.
- B. Reduced "flack" from family members concerning amount of (work-related) time spent away from the home.
- C. Expands the number of hours available for working.
- D. Reduced interruptions (e.g., people dropping by, phone)
- E. Provides a pleasant change in scenery
- F. Increased space and "freedom to move around" (e.g., pacing) while working
- G. Able to wear more comfortable clothing

Negative outcomes:

- A. "Flack" from family members about amount of work-related noise (e.g., printer noise)
- B. Increased delays because needed materials/resources are not available at the home
- C. Delay in talking with colleagues

2. What types of work-related activities do you perform when working at home?

- A. Writing manuscripts, research proposals,
 research, presentations,
 letters of recommendation,
 communications with colleagues,
 NOT lectures
- B. Reading journals, theses & dissertations,
 draft papers
- C. Statistical interpretation (NOT programming)
- D. Reading through computer printouts

3. Overall, what are the major factors that have affected your decision regarding working at home?

- A. Realization of the lack of large blocks of uninterrupted time while at the office
- B. Enjoy working, and working at home allows ... extension of the time able to spend working

W. D.

Interviewed: Thursday, 2/6/86, 3:30 PM

1. Would you briefly describe for me both the positive and negative outcomes that you associate with the idea of working at home?

Positive outcomes:

- A. Getting more work done
- B. Reduces the number of interruptions while working
- C. More pleasant physical surroundings
- D. Provides a change in scenery from the regular office environment
- E. Saves time spent on commuting
- F. Saves time spent on lunches

Negative outcomes:

- A. Constant access to food results in an increase in "munching behavior" (e.g., snacking; weight gain)
- B. Miss both social and professional communication with colleagues
- C. Can be lonely
- D. Materials that are needed (e.g., files) are not always at home
- E. You have to "haul stuff back and forth" between the office and the home

Positive or negative outcome:

- A. "People" (includes both colleagues and students) cannot find you

N. K.

Interviewed: Thursday, 2/6/86, 3:30 PM

1. Would you briefly describe for me both the positive and negative outcomes that you associate with the idea of working at home?

Positive outcomes:

- A. Increased comfort
- B. On the average, fewer interruptions (with the exception being when children are present)
- C. More "amenities" (e.g., easier to get lunch, better food, listen to music)
- D. Quiet, less noise
- E. Home office is "nicely organized" (home office organized better than regular office)
- F. While a microcomputer is present at both locations, the word processing program on the computer at home is easier to use for writing

Negative outcomes:

- A. Fewer resources available (e.g., secretary, mail box, copying machine, library)
- B. Easier to be distracted by such things as hunger, food, snacking
- C. Lack of phone for making long distance business-related calls (difficult to get reimbursed by university for long-distance calls made from the home)
- D. Easier to be drawn into non-work conversations with spouse and/or children

2. What types of work-related activities do you perform when working at home?

- A. Writing correspondence, manuscripts, memos,
 committee work, student feedback
- B. Reading journal reviewing, mail, journal
 articles, theses and dissertations,
 general correspondence
- C. Data analysis
- D. Programming (writing programs)
- E. Data Reduction
- F. Data editing
- G. Telephoning (pick up messages from answering machine at
office)

3. Overall, what are the major factors that have affected your decision regarding working at home?

- A. Time of day. Try to avoid times when children are present
- B. Kind of work that needs to be done. Basically, for anything requiring writing or concentration the home office is better.
- C. If possible, would work 2 to 3 days per (work) week at home, but teaching and meetings require presence on campus.

T. C.

Interviewed: Thursday, 2/6/86, 2:45 PM

1. Would you briefly describe for me both the positive and negative outcomes that you associate with the idea of working at home?

Positive outcomes:

- A. Able to spend increased time working
- B. Increased quality of work for certain types of work (e.g., one that can be done in "fits and starts") and if the work is done at a certain time of day (e.g., early morning)
- C. Increased time in the presence of one's family

Negative outcomes:

- A. Increased interruptions while working at home
- B. Easier to avoid work demands
- C. Decreased quality and efficiency for tasks that cannot be interrupted

2. What types of work-related activities do you perform when working at home?

- A. Writing manuscripts, memos, letters of recommendation, composing documents, grading papers, preparing lectures

LESS Likely: reading journals and books

3. Overall, what are the major factors that have affected your decision regarding working at home?

- A. If time pressure is great (e.g., deadlines), more likely to work at home
- B. If the task is one that can be interrupted or if it is a time of day when likely to be left alone
- C. Now have a computer at both locations

D. I. Interviewed: Thursday, 2/13/86, 3:00 PM

1. Would you briefly describe for me both the positive and negative outcomes that you associate with the idea of working at home?

Positive outcomes:

- A. Fewer interruptions
- B. Quiet place for working
- C. Able to spread out work and leave it without concern for privacy
- D. More control over working time (when & how) and being able to work at odd hours
- E. Dress more casually (e.g., wear sweat suit & tennis shoes)
- F. Be more comfortable
- G. Freedom of choice of work environment (e.g., work on porch, in front of fireplace)

Negative outcomes:

- A. More nonwork distractors (e.g., kids, television)
- B. Increased temptation from other activities that pull one away from work (e.g., checking mail immediately after delivery, lawn that needs to be mowed)
- C. More difficult to communicate with others (colleagues)
- D. Lack of necessary equipment, books, journals, etc.
- E. Necessary materials (e.g., journals) are in the wrong place
- F. Nearness to the refrigerator
- G. Difficult to make long-distance calls
- H. Miss telephone messages

Positive or Negative outcome:

- A. Extent to which good workspace is available in the home

Things that drive away from office:

- A. Number of interruptions
- B. Heat turned off in building on weekends

2. What types of work-related activities do you perform when working at home?

- A. Writing memos, letters
- B. Reading journals, theses and dissertations
- C. Editing
- D. Reviewing manuscripts
- E. Generally, any tasks that require only "second level"
concentration

3. Overall, what are the major factors that have affected your decision regarding working at home?

- A. Able to get big blocks of time with no interruptions
- B. Allows one to "coordinate" family and home needs with work

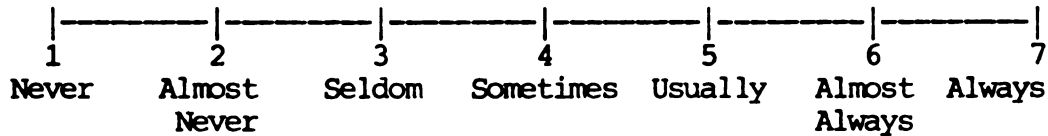
APPENDIX B

Development of Personality Measures

Appendix B

Development of Personality Measures

Part I: Original Wording of Need for Achievement Affiliation, Autonomy, and Locus of Control Scales



Need For Achievement

1. I do my best work when my job assignments are fairly difficult. (MNQ)
2. I try very hard to improve on my past performance at work. (MNQ)
3. I take moderate risks to get ahead at work. (MNQ; revised)
4. I try to avoid added responsibilities on my job. (MNQ)
5. I try to perform better than my coworkers. (MNQ)
6. I almost always do my best whether I am alone or with someone. (Friis & Knox, 1972)
7. I appreciate opportunities to discover my own strengths and weaknesses. (Mehrabian & Bank, 1978)
8. Everyday, I try to accomplish something worthwhile. (Friis & Knox, 1972)

* MNQ = Manifest Needs Questionnaire
(Steers & Braunstein, 1976)

Need for Affiliation

1. When I have a choice, I try to work in a group instead of by myself. (MNQ)
2. I pay a good deal of attention to the feelings of others at work. (MNQ)
3. I prefer to do my own work and let others do theirs. (MNQ; revised)
4. I express my disagreements with others openly. (MNQ; revised)
5. I find myself talking to those around me about non-business related matters. (MNQ)
6. I consider myself a good mixer at work. (Friis & Knox, 1972; revised)
7. If at all possible, I avoid being alone (Friis & Knox, 1972)
8. I often attend social gatherings just to be with others. (Friis & Knox, 1972)

Need for Autonomy

1. In my work assignments, I try to be my own boss. (MNQ)
2. I go my own way at work, regardless of the opinions of others. (MNQ)
3. I disregard rules and regulations that hamper my personal freedom. (MNQ)
4. I consider myself a "team player" at work. (MNQ; revised)
5. I try my best to work alone on a job. (MNQ)
6. I prefer projects where I can decide what to do. (original)
7. I like to have other persons monitoring my work. (original)
8. I consider myself to be something of a maverick at work. (original)

* MNQ = Manifest Needs Questionnaire
(Steers & Braunstein, 1976)

Locus of Control Items

Source: Duttweiler, 1984

1	2	3	4	5
RARELY	OCCASIONALLY	SOMETIMES	FREQUENTLY	USUALLY
Less than 10% of the time	About 30% of the time	About half of the time	About 70% of the time	More than 90% of the time

Autonomy

1. I _____ need encouragement from others for me to keep working at a difficult task. (modified)
2. I _____ prefer to learn the facts about something from someone else rather than have to dig them out myself.
3. What other people think _____ influences my behavior. (modified)
4. I _____ need someone else to praise my work before I am satisfied with what I've done.
5. I _____ get discouraged when doing something that takes a long time to achieve results.
6. I _____ prefer situations where I can depend on someone else's ability rather than just my own.
7. Having someone important tell me I did a good job is _____ more important to me than feeling I've done a good job.

Self Confidence

1. I _____ like jobs where I can make decisions and be responsible for my own work.
2. I will _____ accept jobs that require me to supervise others.
3. I _____ like to have a say in any decisions made by a group I'm in.
4. I _____ enjoy being in a position of leadership.
5. I am _____ sure enough of my opinions to try and influence others.
6. I _____ stick to my opinions when someone disagrees with me.
7. When I'm involved in something I _____ try to find out all I can about what is going on even when someone else is in charge.

Part II: Pilot Survey Personality Scales

Need for Achievement

1. I perform best when my job assignments are of average difficulty.
2. The frequency with which I try very hard to improve on my past performance at work.
3. The extent to which I take moderate risks in order to get ahead at work.
4. The extent to which I try to avoid added responsibilities on my job.
5. The frequency with which I try to out-perform my coworkers.
6. The extent to which I only do my best when I am with someone else.
7. The extent to which I seek out opportunities to exhibit my strengths.
8. The frequency with which I feel that I am accomplishing something worthwhile while working.

Need for Affiliation

1. The extent to which I would prefer to work in a group instead of by myself.
2. The frequency with which I pay attention to the feelings of others at work.
3. The extent to which I prefer to do my own work and let others do theirs.
4. The extent to which I openly express my disagreements with others.
5. The extent to which I find myself talking to those around me about non-business related matters.
6. The extent to which I consider myself to be a good socializer at work.
7. The extent to which I avoid working alone.
8. The extent to which I attend social gatherings just to be around other people.

Need for Autonomy

1. The extent to which I try to be my own boss at work.
2. The frequency with which I go my own way at work, regardless of the opinions of others.
3. The frequency with which I disregard rules and regulations that hamper my personal freedom.
4. The extent to which I consider myself to be a "team player" at work.
5. The extent to which I prefer to work alone on a job.
6. The frequency with which I prefer to work on projects where I decide what will be done.
7. The extent to which I enjoy having other persons check my work.
8. The extent to which I consider myself to be an independent spirit at work.

Locus of Control (External)

1. The extent to which I need encouragement from others for me to keep working at a difficult task.
2. The frequency with which I prefer to learn the facts about something from someone else rather than have to dig them out myself.
3. The extent to which what other people think influences my behavior.
4. The extent to which I need someone else to praise my work before I am satisfied with what I've done.
5. The frequency with which I get discouraged when doing something that takes a long time to achieve results.
6. The frequency with which I prefer situations where I can depend on someone else's ability rather than just my own.
7. The extent to which having an important colleague tell me that I did a good job is more important to me than my own feelings about my performance.

Locus of Control (Internal)

1. The extent to which I enjoy jobs where I can make decisions and be responsible for my own work.
2. The frequency with which I will accept jobs that require me to supervise others.
3. The frequency with which I like to have a say in any decisions made by a group I'm in.
4. The extent to which I enjoy being in a position of leadership.
5. The frequency with which I try to influence the opinions of others.
6. The extent to which I stick to my opinions when my peers disagree with me.
7. The extent to which I try to find out all I can about what is going on even when someone else is in charge.

Part III: Faculty Questionnaire Personality Scales

Need for Achievement

1. The frequency with which I try very hard to improve on my past performance at work.
2. The extent to which I enjoy jobs where I can make decisions and be responsible for my own work.
3. The extent to which I take moderate risks in order to get ahead at work.
4. The frequency with which I will accept jobs that require me to supervise others.
- 5.* The extent to which I try to avoid added responsibilities on my job.
6. The frequency with which I like to have a say in any decisions made by a work group in which I am a member.
7. The frequency with which I try to out-perform my coworkers at the university.
8. The frequency with which I prefer to work on projects where I decide what will be done.
9. The frequency with which I feel that I am accomplishing something worthwhile while working.
10. The extent to which I seek out opportunities at the university to exhibit my strengths.
11. The extent to which I consider myself to be an independent spirit at work.

Need for Affiliation

1. The extent to which I would prefer to work in a group instead of by myself.
2. The extent to which I only do my best when I am with someone else.
3. The frequency with which I prefer situations where I can depend on someone else's ability rather than just my own.
- 4.* The extent to which I prefer to work alone on a job.
5. The extent to which I avoid working alone.

* = Item recoded prior to summation

External Locus of Control

1. The extent to which the opinions of coworkers influences my behavior.
2. The extent to which I need encouragement from others for me to keep working at a difficult task.
3. The frequency with which I prefer to learn the facts about something from someone else rather than have to dig them out myself.
4. The extent to which I need praise from colleagues of my work before I am satisfied with what I've done.
5. The frequency with which I get discouraged when doing something that takes a long time to achieve results.
6. The extent to which having an important colleague tell me that I did a good job is more important to me than my own feeling about my performance.

APPENDIX C

Survey Recruitment Letter

Appendix C

Survey Recruitment Letter

May 28, 1986

Dear Michigan State Faculty Member:

The increasing sophistication and availability of personal computers has stimulated popular and professional interest in "telecommuting" and other forms of work-at-home behavior. A recent survey found that university professors and researchers are a significant subgroup among those currently working at home. A questionnaire has been developed to gather additional information regarding work-at-home behavior among faculty members.

My name is Brian Loher and I am a doctoral student in the Michigan State University Industrial/Organizational psychology program. The survey is being conducted as part of my dissertation research. I would like to ask you to take 20 to 25 minutes to voluntarily complete the survey. It is not necessary that you use a personal computer as part of your work activities to participate. Should you be interested in participating, simply complete the bottom portion of this letter and return it via campus mail to BRIAN LOHER c/o DEPARTMENT OF PSYCHOLOGY, 129 PSYCHOLOGY RESEARCH BUILDING, MICHIGAN STATE UNIVERSITY by June 4, 1986. A survey will be sent to your campus address.

A copy of a report summarizing the results of the survey will be made available to survey participants upon written request. Results should be available by October, 1986.

Thank-you for your interest in the survey.

Sincerely,

Brian T. Loher
Industrial/Organizational
Psychology Program
Michigan State University
(517) 353-9166

NAME: _____

CAMPUS ADDRESS: _____

Out of the total amount of time that you devote to university-related work activities during an average week, approximately what percent of that time do you spend working at home rather than at your office/lab? _____

APPENDIX D

Cover Letter and Faculty Questionnaire

Appendix D

Cover Letter and Faculty Questionnaire

June 3, 1986

Dear Michigan State Faculty Member:

Thank you for your interest in participating in the survey on work-at-home behavior among university faculty members. A copy of the questionnaire is enclosed. The questionnaire should require 20 to 25 minutes to complete. If you decide to continue your participation in the study, please complete the questionnaire and return it via CAMPUS MAIL to BRIAN LOHER, DEPARTMENT OF PSYCHOLOGY, 129 PSYCHOLOGY RESEARCH BUILDING, MICHIGAN STATE UNIVERSITY, by June 20, 1986.

A copy of a report summarizing the results of the study will be made available upon written request to survey participants. Results should be available by October, 1986.

If you have any questions regarding the survey, I can be contacted at either 353-9166 (Office) or 351-5678 (Home). Your comments on the survey are welcome and appreciated.

Sincerely,

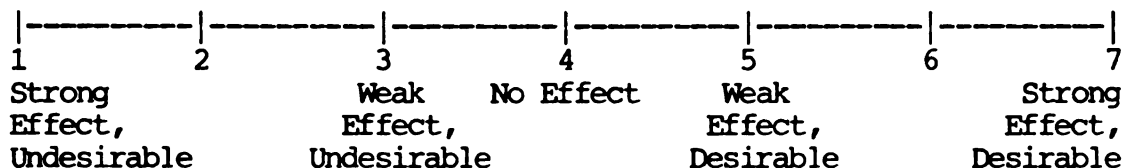
Brian T. Loher
Industrial/Organizational
Psychology Program
Department of Psychology
Michigan State University
(517) 353-9166

WORK-AT-HOME QUESTIONNAIRE

INSTRUCTIONS: Please answer the following items to the best of your ability. If a question is not applicable to your particular situation, write "NA" in the blank space provided.

1. Sex: M ____ F ____ 2. Age ____
3. What is your current university rank?
____ instructor/lecturer ____ professor
____ assistant professor ____ professor emeritus
____ associate professor ____ other _____
4. Tenure track ____ Non-tenure track ____
5. Are you currently tenured? ____ YES ____ NO
6. University college _____
7. Department/division _____
8. Do you have a separate office space within your residence
(e.g., a room with a door that can be closed)?
YES ____ NO ____
9. Do you have a private office space at your office/lab?
YES ____ NO ____
10. Do you have a personal computer within your home?
YES ____ NO ____
11. Do you have a personal computer at your office/lab?
YES ____ NO ____
12. How many children/adolescents are currently living at your
residence? ____ What are their ages? _____
13. Including yourself, what is the total number of persons who
are currently living at your residence? _____
14. What is the approximate number of hours that you are required
to spend in university meetings during an average week? _____
15. For the current term, how many hours per week do you typically
spend in a classroom (e.g., lecturing)? _____
16. For a one-way trip, what would be the average amount of time
in MINUTES that it would take you to travel (by car) to your
office? _____
17. How many automobiles are available to persons living at your
residence? _____

18. In this section you are asked to make ratings of outcomes that may result from working at HOME. In the column to the LEFT of each outcome indicate the effect that you perceive WORKING AT HOME has on the outcome using the following scale:



To illustrate, for the outcome "Time with Family" a response of "5" indicates a perception that working at home has only a weak (yet desirable) effect on the amount of time spent with one's family. A response of "7" indicates that working at home has a strong effect (that one finds desirable) on time with family. Respond "NA" if an outcome is not applicable to your situation.

Effect of
Working at
HOME on:

Outcomes

Outcome
Importance

_____	Interruptions while working	_____
_____	Distractions from working	_____
_____	Working at my own pace	_____
_____	Time spent commuting	_____
_____	Conflict between work and nonwork roles	_____
_____	Caring for small children	_____
_____	Costs for day care	_____
_____	Work attire	_____
_____	Costs for gasoline	_____
_____	Costs for dry cleaning	_____
_____	Overall work performance	_____
_____	Communication with peers	_____
_____	Motivation to work	_____
_____	Reduction of work-related stress/anxiety	_____
_____	Perceived safety	_____
_____	Amount of space available for working	_____
_____	Control over the scheduling of my work	_____
_____	Physical comfort while working	_____
_____	Access to materials (e.g., journals, files)	_____
_____	Loneliness	_____
_____	Access to resources (phone, copiers, secretaries)	_____
_____	Access to food	_____
_____	Time with family	_____
_____	The amount of time spent alone	_____
_____	Time available for working	_____
_____	Career opportunities	_____
_____	Participation in office politics	_____

In the column to the RIGHT of each outcome, rate the importance of that outcome using a scale from 1 (NO IMPORTANCE) to 7 (VERY IMPORTANT). Respond "NA" if the outcome is not relevant.

INSTRUCTIONS: Use the scale below to rate your PERCEPTION of the supportiveness of the given reference groups towards faculty who work at home DURING TRADITIONAL WORK HOURS (i.e., 8:30 AM to 5:00 PM). Respond "NA" if a group is not applicable to your situation.

-----	-----	-----	-----	-----	-----
1	2	3	4	5	6
Strongly Oppose		Mildly Oppose	Neutral	Mildly Support	Support
					Strongly Support

RESPONSE

_____ 19. To what extent do you feel the other faculty members in your PROGRAM support colleagues who work at home?

_____ 20. To what extent do you perceive that the STUDENTS in your program support the idea of faculty working at home?

_____ 21. In general, how supportive do you feel members of your DEPARTMENT/DIVISION are of faculty working at home?

_____ 22. To what extent do you feel the CENTRAL ADMINISTRATION supports the idea of faculty working at home?

_____ 23. Overall, to what extent do you feel the other persons living at your residence support your working at home?

24. In this section, please use the scale given below to rate the ATTRACTIVENESS of the HOME for performing certain work activities. Respond "NA" if an activity is not relevant to your job.

-----	-----	-----	-----	-----	-----
1	2	3	4	5	6
Very Unattractive		Mildly Unattractive	Neutral	Mildly Attractive	Highly Attractive

<u>RESPONSE</u>	<u>Activity</u>
-----------------	-----------------

_____	Working (total)
_____	Meeting with students (graduate/undergraduate)
_____	Class preparation
_____	Talking on the telephone
_____	Grading papers & examinations
_____	Data analysis & statistical interpretation
_____	Writing (e.g., manuscripts, research proposals, technical reports, memos, committee work, reviews)
_____	Reading (e.g., professional journals, manuscripts, grant applications, theses/dissertations)

INSTRUCTIONS: Use the following scale to respond to items 25 - 52.
Write your response in the space provided to the left of each item.

-----	-----	-----	-----	-----	-----	
1	2	3	4	5	6	7
NEVER	RARELY	OCCASIONALLY	SOMETIMES	FREQUENTLY	USUALLY	ALWAYS
	Under	@ 30%	@ 50%	@ 70%	Over	
	10% of	of the	of the	of the	90% of	
	the time	time	time	time	the time	

RESPONSE

- _____ 25. The frequency with which I try very hard to improve on my past performance at work.
- _____ 26. The extent to which I would prefer to work in a group instead of by myself.
- _____ 27. The extent to which I enjoy jobs where I can make decisions and be responsible for my own work.
- _____ 28. The extent to which the opinions of coworkers influences my behavior.
- _____ 29. The extent to which I take moderate risks in order to get ahead at work.
- _____ 30. The frequency with which I go my own way at work, regardless of the opinions of others.
- _____ 31. The extent to which I need encouragement from others for me to keep working at a difficult task.
- _____ 32. The frequency with which I will accept jobs that require me to supervise others.
- _____ 33. The extent to which I only do my best when I am with someone else.
- _____ 34. The frequency with which I prefer to learn the facts about something from someone else rather than have to dig them out myself.
- _____ 35. The extent to which I try to avoid added responsibilities on my job.
- _____ 36. The frequency with which I prefer situations where I can depend on someone else's ability rather than just my own.
- _____ 37. The frequency with which I like to have a say in any decisions made by a work group in which I am a member.
- _____ 38. The extent to which I need praise from colleagues of my work before I am satisfied with what I've done.

1	2	3	4	5	6	7
NEVER	RARELY	OCCASIONALLY	SOMETIMES	FREQUENTLY	USUALLY	ALWAYS
	Under	@ 30%	@ 50%	@ 70%	Over	
	10% of	of the	of the	of the	90% of	
	the time	time	time	time	the time	

RESPONSE

- _____ 39. The frequency with which I try to out-perform my coworkers at the university.
- _____ 40. The extent to which I stick to my opinions when my peers disagree with me.
- _____ 41. The frequency with which I prefer to work on projects where I decide what will be done.
- _____ 42. The extent to which I prefer to work alone on a job.
- _____ 43. The frequency with which I get discouraged when doing something that takes a long time to achieve results.
- _____ 44. The frequency with which I feel that I am accomplishing something worthwhile while working.
- _____ 45. The extent to which I try to find out all I can about what is going on even when someone else is in charge.
- _____ 46. The extent to which having an important colleague tell me that I did a good job is more important to me than my own feeling about my performance.
- _____ 47. The extent to which I seek out opportunities at the university to exhibit my strengths.
- _____ 48. The extent to which I avoid working alone.
- _____ 49. The extent to which I attend social gatherings just to be around other people.
- _____ 50. The extent to which I consider myself to be an independent spirit at work.
- _____ 51. In comparison with other faculty, how often do you perceive that you have the opportunity to work at home?
- _____ 52. What is the frequency with which your work requires you to monitor the work of others?

53. In this section you are asked to respond to two questions. For the FIRST COLUMN ("Total Hours Spent"), you are asked to estimate the TOTAL number of hours that you spend on the given university-related work activity during an AVERAGE WEEK.

In the SECOND COLUMN ("Hours Working at Home"), you are asked to estimate the number of hours (out of the total from Column 1) that you spend on the given activity WHILE AT HOME.

Total Hours Spent:	Hours Working at Home on:	Activities
_____	_____	Working (total)
_____	_____	Meeting with students (graduate/undergraduate)
_____	_____	Class preparation
_____	_____	Talking on the telephone
_____	_____	Grading papers & examinations
_____	_____	Data analysis & statistical interpretation
_____	_____	Writing (e.g., manuscripts, reviews, memos, research proposals, technical reports, committee work)
_____	_____	Reading (e.g., professional journals, manuscripts, grant applications, theses/dissertations)
_____	_____	Other (please describe) _____
_____	_____	_____
_____	_____	_____

COMMENTS regarding the survey: _____

Thank you for your time and effort in filling out this survey. Please place your completed questionnaire in a CAMPUS MAIL envelope and send it to BRIAN LOHER, c/o DEPARTMENT OF PSYCHOLOGY, MICHIGAN STATE UNIVERSITY. Should you have any questions about the survey, the researcher can be contacted at 353-9166 (Office) or 351-5678 (Home).

APPENDIX E

Follow-up Letter

Appendix E
Follow-up Letter

June 24, 1986

Dear Michigan State Faculty Member:

During spring term you indicated your willingness to participate in a survey on work-at-home behavior among MSU faculty members. A copy of the survey was mailed to your campus address. Our records indicate that you have not, as yet, returned the survey. In order to facilitate the compilation of study results within a reasonable time-frame, it is critical that all surveys be returned by June 30, 1986. I would like to ask you to take a few minutes sometime this week to complete and return your copy of the survey. If needed, a backup copy of the survey is enclosed. Please disregard this note if you have already returned the survey or have decided to discontinue your participation in the study. Once again, I would like to take this opportunity to thank you for your interest in the study and for your efforts as a survey participant.

Sincerely,

Brian T. Loher
Industrial/Organizational
Psychology Program
Department of Psychology
Michigan State University

(517) 353-9166

P.S. Please note that survey items regarding an "average" week refer to an average week during the regular academic year. Items relating to the "current" term refer to spring term.

Enc.

APPENDIX F

Full Correlation Matrix

Appendix F

Full Correlation Matrix

Predictor Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
1. Sex	-																													
2. Age	.29	-																												
3. Academic Rank	.43	.72	-																											
4. Tenure Track	.41	.21	.55	-																										
5. Tenure Status	.38	.65	.84	.53	-																									
6. Need Achvment	.08	-.07	.11	.06	.04	-																								
7. Need Affiliat	.05	-.10	-.05	-.05	-.09	-.02	-																							
8. Ext Loc. Cont.	-.03	-.15	-.11	.04	-.15	.04	.47	-																						
9. Interruptions	-.27	-.02	-.13	-.20	-.13	.13	-.06	-.05	-																					
10. Access	-.15	.05	-.08	-.11	-.04	.13	.19	.42	-																					
11. Commute	-.26	.00	-.08	-.11	-.05	.07	.03	.32	.31	-																				
12. Commute	-.15	-.12	-.11	-.03	.00	-.01	-.03	.08	.11	.12	.16	-																		
13. Family	-.03	-.06	-.02	.10	.05	.07	-.06	.15	.05	.18	.24	.05	-																	
14. Attractive	-.30	.04	-.09	-.15	-.04	.18	-.10	-.12	.64	.42	.44	.14	.38	-																
15. Opportunity	-.03	-.10	-.14	-.07	-.17	.07	-.10	-.08	.23	.26	.18	.09	-.12	.09	-															
16. Monitor	.02	-.12	.09	.04	.01	.36	.22	.10	.01	-.13	-.06	-.12	-.01	-.03	-.19	-														
17. Time Meeting	-.02	.06	.27	.11	.20	.28	.08	.05	.03	-.04	-.02	.02	-.03	-.21	.28	-														
18. Time in Class	.08	.14	.03	.06	.11	.01	-.09	.01	.02	-.03	.07	-.07	-.07	.04	-.10	-.16	-													
19. Support	-.05	.13	.04	.10	-.01	.14	-.24	-.21	.24	.31	.23	.09	.21	.33	.34	-.02	-.13	-.06	-											
20. Home Office	.02	.05	.10	.07	.07	.20	-.07	-.13	.29	.10	.19	.03	.08	.29	.05	.07	.04	.07	.20	-										
21. Work Office	.12	.11	.18	.19	.17	.04	-.01	-.03	-.09	-.16	-.13	-.08	-.12	-.13	-.01	.10	.03	-.05	.09	-.05	-									
22. Home PC	.12	-.02	.05	.00	-.07	.19	-.05	-.14	.14	-.02	.03	.08	.20	.11	.15	.07	.02	.15	.21	.00	-									
23. Work PC	.14	-.03	.05	.16	.10	.03	.16	-.10	-.18	-.11	-.17	.09	-.19	-.17	-.07	.08	.01	-.10	-.02	-.01	.13	.00	-							
24. No. of Kids	.12	-.24	.07	-.02	-.02	.01	.12	-.02	-.38	-.07	-.32	-.35	.02	-.01	.02	.18	-.11	-.05	.29	.13	.06	-.14	-.06	-						
25. Age of Kids	.17	.12	.13	.16	-.03	-.08	.15	.11	.06	-.03	-.12	-.05	.05	-.17	-.19	.02	.15	-.14	-.15	.02	.11	.16	.91	-.07	-					
26. No. Persons	.17	.17	.03	.03	.04	.02	-.09	.04	.18	.06	.14	-.06	.08	.09	.36	-.02	.05	-.11	-.02	.03	-.03	-.10	-.06	.00	.01	.01	-.09	-.09	-.08	-
27. Travel Time	-.11	-.07	-.13	-.26	.14	.04	-.05	.03	.14	.08	.09	.36	-.02	.05	-.11	-.02	.03	-.03	-.10	-.06	.00	.01	.01	-.09	-.09	-.08	-			
28. No. of Cars	.15	.10	.18	.02	.16	.08	.16	-.04	-.11	-.03	-.11	-.02	.05	.01	-.24	.09	.19	-.12	-.12	.10	.09	.17	.10	.26	.47	.39	.14	-		
29. % Time Home	-.14	.00	-.06	-.18	-.02	.10	-.25	-.16	.43	.31	.32	.11	.12	.13	.14	.15	.16	.17	.18	.19	.20	.21	.22	.23	.24	.25	.26	.27	.28	.29

Note: Decimals omitted to conserve space.

APPENDIX G
Supplemental Tables for Regression Analyses

Appendix G

Supplemental Tables for Regression Analyses

Supplement to Table 24

NOTE: Table 24 analyses do NOT include POE Composite #5
(Effects on Family Situation)

Beta Weights for Overall Regression Equation

Variable	Beta	F	Sign.
POE Composite #1 (Interr/Dist)	.452	30.46	.001
POE Composite #2 (Access)	.167	4.23	.04
POE Composite #3 (Comfort)	.165	4.64	.03
POE Composite #4 (Commuting)	.036	0.27	NS
Need for Achievement Scale	.140	3.85	.052
Need for Affiliation Scale	-.007	0.01	NS
External Locus of Control	-.069	0.77	NS
Sex	-.123	2.45	.12
Tenure/Nontenure Track	.010	0.02	NS

Criterion: Attractiveness

Sample size: 117

Overall equation: df= 9, 107; F = 12.31, p < .001

Supplement to Table 25

NOTE: Table 25 analyses do NOT include the variable
"Average Age of Children"

Beta Weights for Overall Regression Equation

Variable	Beta	F	Sign.
Attractiveness	.370	18.48	.001
Monitor Others	-.286	12.33	.001
Perceived Opportunity	.216	6.49	.012
Time in Meetings	.040	0.24	NS
Time in Classroom	-.011	0.02	NS
Reference Grp. Supportiveness	-.048	0.30	NS
PC at University	-.130	2.77	.10
PC at Home	.157	3.70	.06
Private Space at University	-.035	0.20	NS
Separate Space in Home	.087	1.11	NS
Number of Persons in Household	-.044	0.25	NS
Number of Vehicles in Household	-.001	0.00	NS
Time to Travel to University	-.078	0.99	NS

Criterion: Relative Time at Home

Sample size: 117

Overall equation: $df = 13, 103$; $F = 5.78$, $p < .001$

Supplement to Table 26: Step 1 of Regression Analyses for Mediating Effect

NOTE: Table 26 analyses do NOT include POE Composite #5 (Effects on Family Situation)

Beta Weights for Overall Regression Equation

Variable	Beta	F	Sign.
POE Composite #1 (Interr/Dist)	.282	8.83	.004
POE Composite #2 (Access)	.099	1.10	NS
POE Composite #3 (Comfort)	.178	4.01	.05
POE Composite #4 (Commuting)	.040	0.25	NS
Need for Achievement	.061	0.54	NS
Need for Affiliation	-.216	5.70	.02
External Locus of Control	-.020	0.05	NS
Sex	.060	0.43	NS
Tenure/Nontenure Track	-.142	2.61	.11

Criterion: Relative Time at Home

Sample size: 125

Overall equation: $df = 9, 115$; $F = 5.29$, $p < .001$

Supplement to Table 27: Step 2 of Regression Analyses for Mediating Effect

NOTE: Part II focuses on prediction of Relative time at home using the Outcome Composites, Individual Differences - Personality, and Attractiveness; Analyses do NOT include POE Composite #5 (Effects on Family Situation)

Beta Weights for Overall Regression Equation

Variable	Beta	F	Sign.
POE Composite #1 (Interr/Dist)	.187	2.98	.09
POE Composite #2 (Access)	.043	0.20	NS
POE Composite #3 (Comfort)	.131	2.04	.16
POE Composite #4 (Commuting)	.026	0.10	NS
Need for Achievement	.022	0.07	NS
Need for Affiliation	-.196	4.57	.03
External Locus of Control	-.022	0.06	NS
Attractiveness	.242	4.60	.03

Criterion: Relative Time at Home

Sample size: 117

Overall equation: $df = 8, 108$; $F = 5.96$, $p < .001$

Supplement to Table 28: Regression Analyses for "Simplified" Model

NOTE: Analyses do NOT include POE Composite #5 (Effects on Family Situation)

Beta Weights for Overall Regression Equation

Variable	Beta	F	Sign.
POE Composite #1 (Interr/Dist)	.151	1.83	NS
POE Composite #2 (Access)	.007	0.01	NS
POE Composite #3 (Comfort)	.077	0.70	NS
POE Composite #4 (Commuting)	-.013	0.03	NS
Attractiveness	.321	7.78	.007
Monitor Others	-.267	9.60	.003
Perceived Opportunity	.216	5.59	.02
Time in Meetings	.041	0.23	NS
Time in Classroom	.013	0.02	NS
Reference Grp. Supportiveness	-.029	0.10	NS

Criterion: Relative Time at Home

Sample size: 107

Overall equation: $df = 10, 96$; $F = 6.01$, $p < .001$

Supplement to Table 29: Regression Analyses for Prediction of Outcomes Index

Beta Weights for Overall Regression Equation

Variable	Beta	F	Sign.
Sex	-.255	7.48	.007
Tenure/Nontenure Track	.043	0.19	NS
Need for Achievement	.058	0.46	NS
Need for Affiliation	.026	0.07	NS
External Locus of Control	-.031	0.10	NS
PC at University	-.017	0.04	NS
PC at Home	.089	1.03	NS
Private Space at University	-.054	0.40	NS
Separate Space in Home	.192	4.55	.04
Number of Persons in Household	-.230	5.85	.02
Number of Vehicles in Household	.027	0.08	NS
Time to Travel to University	.232	6.73	.01

Criterion: Combined Outcomes Index

Sample size: 120

Overall equation: $df = 12, 107$; $F = 3.26$, $p < .001$

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