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***CELLULAR TELEPHONES:
A COMPARATIVE ANALYSIS OF
THEIR ADOPTION AND IMPACTS***

by

**Robert Tannenbaum
(Bachelor of Commerce,
Concordia University)**

**A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of**

Master of Management Studies

**School of Business
Carleton University
Ottawa, Ontario**

September 13, 1991

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CELLULAR TELEPHONES: A COMPARATIVE ANALYSIS OF
THEIR ADOPTION AND IMPACTS

submitted by Robert Tannenbaum, B.Comm.
in partial fulfillment of the requirements for
the degree of Master of Management Studies

for Linda Duxbury
Thesis Supervisor

Chair, School of Business

Carleton University
September 13, 1991

ABSTRACT

This research was designed to examine the adoption and impact of cellular telephones through a survey of 3160 cellular network subscribers. The objectives of the study were twofold: (1) to describe people's reasons for using cellular telephones; and (2) to determine if using a cellular telephone has altered people's abilities to balance their work and family demands. Comparative analyses were performed between men and women since the literature suggested that gender differences might exist.

The findings of this study indicate that people use cellular telephones primarily to exert more control over their work environments. Women also use their phones to manage their family responsibilities.

Cellular telephones do improve people's ability to balance work and family demands. This conclusion is deduced from the fact that cellular users with heavy work demands are able to maintain the same levels of time management and perceived control as other cellular users. They also do not suffer substantially more than other users from the negative effects of perceived stress and work-family conflict and they are able to maintain equivalent levels of work, family and life satisfaction.

Women, more than men, appreciate the increased ability provided by a cellular telephone to balance their work and family demands. This is most likely due to the fact that they are responsible for a disproportionate amount of family duties. Being a parent does not seem to make a difference concerning either adoption or impact of the technology. This finding is somewhat difficult to substantiate, however, given the heterogeneous nature of the sample.

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Introduction

According to recent newspaper and magazine articles, cellular telephones can help busy people cope with their professional demands (The Financial Post, 1990, Moneywise, 1990, The Wall Street Journal, 1989, Cellular Business, 1988, The Vancouver Sun, 1989, BusinessWeek, 1988). The technology, they claim, has helped people be more productive, organized and prepared when it comes to managing their jobs and lives (Zey, 1988, Lewis et al., 1988). Little empirical work exists, however, to substantiate these claims.

The purpose of this study is to identify what motivates people to adopt cellular telephones. It also attempts to quantify the benefits to employees of cellular phone use. Specifically, this study examines how cellular phone use benefits the user in terms of perceived work productivity, stress and control, time management, job, family and life satisfaction and work-family conflict.

A number of variables may influence why people choose to use a cellular phone and the consequences they experience in adopting this technology. This study looks at four of these variables: gender, parental status and work and family demands.

The main academic contribution of this study is that it will fill a current gap in the literature on portable technology concerning cellular telephones. It will also open up new avenues of potential research concerning the differences between men and women and parents and non-parents where this type of technology is concerned. The study will also add to the bodies of literature on

work-family conflict, perceived work productivity, stress and control, and job, family and life satisfaction.

Potential adopters of the technology will have more information on the advantages and disadvantages of using a cellular telephone. This study will help them when they make their decisions on whether or not to incorporate cellular telephones as part of their lifestyles. It will also assist them in deriving the full benefits that can come from using a cellular telephone.

Finally, managers of organizations will become more aware of the benefits that they and their employees can derive when cellular telephones are adopted as a work tool. With access to the right information, managers will have the opportunity to enhance their employee's ability to work. This is in the best interests of their companies.

The first section of the thesis develops the theoretical framework on which the research was based and provides definitions for the concepts that will be used on an ongoing basis throughout the thesis. The second section details the development of the research questions and hypotheses and includes a review of the relevant literature. The third section outlines the research methodology which includes the sample, the survey instrument, the survey measures and the data analysis. The fourth section presents a detailed report and discussion of the findings. Section five outlines the conclusions and implications of the findings while the final section lists the strengths and weaknesses of the research.

Research Framework and Definitions

The research framework shown in Figure 1 was developed to guide this research. The first aspect of the study involved ascertaining cellular telephone users' (CTUs') motivations for adopting a cellular phone and determining if these motivations were affected by frequency of use, parental status, gender and work and family demands. All users referred to in this study possessed a cellular telephone. Since little empirical research existed in this area, exploratory research questions instead of hypotheses were employed for the motivation issue.

The second aspect of the study examined whether the cellular telephone is a useful mechanism for coping with the simultaneous demands of work and the family. According to Dotto (1989), the technology is capable of freeing users from location and time constraints by giving them the ability to perform work tasks outside of traditional office boundaries at virtually any time of the day or night. It was hypothesized that not only might this form of work-arrangement flexibility result in increased productivity and improved time management (thereby leaving more free time for other tasks), but that it also had the potential to allow CTUs to schedule their work at more convenient times (Gallup, 1991, Jarratt & Coates, 1990, Duxbury & Higgins, 1990B, Dotto, 1989). This study examined whether the increased opportunity a cellular telephone provided for a user to respond to unexpected changes in work and home activities better helped them minimize the negative consequences of work-family conflict and perceived stress, and maximize the positive consequences of perceived work productivity,

Figure 1 - Research Framework

perceived control, time management, work, family and life satisfaction.

The two-dimensional model of work strain developed by Karasek (1979) can be used to justify the proposed relationship between cellular telephone use and the ability to balance work and family demands (i.e. individual, organizational and family consequences). Karasek's model focuses on describing the objective conditions which are conducive to conflict. He identifies two key operating forces: role demands and control. His job strain model asserts that jobs with similar demands may differ substantially in the amount of conflict generated by virtue of the degree of individual control over the situation. Karasek (1979) concludes that a highly demanding job only produces conflict in the worker when it is accompanied by constraints which interfere with the worker's ability to utilize coping mechanisms in an attempt to overcome those conflicts. Karasek's (1979) model can be applied in the context of this research.

Work time flexibility refers to a worker's level of control over the scheduling of work time. Work location flexibility refers to a worker's level of control over where the work will be done. Together, these will be referred to as work-arrangement flexibility. It is well-established (e.g., Renshaw, 1979) that an individual's perception of control over stressful events is a key factor in coping successfully with stress. The literature suggests that work-arrangement flexibility will help workers better manage the conflicting demands of work and the family by increasing their ability to control, predict and absorb change (Pleck et al., 1980, Rothman & Marks, 1987, Hessing, 1988, Olson & Primps, 1984). Cellular telephones increase both work time and location flexibility. As such, they offer

an employee an increased sense of control and an increased ability to cope with work and family demands. This research assumes that as the frequency of cellular telephone use increases, so does the employee's ability to cope.

The model also postulates that the relationship between cellular telephone use and the ability to balance work and family demands is moderated by the magnitude of the work and family role demands. Previous research can be used to justify the inclusion of work and family demands as moderating variables. The inability to cope with conflicting work and family demands have, for example, been shown to have an impact on an individual's work productivity and work and family satisfaction (Greenhaus, 1988, Greenhaus & Beutell, 1985, Kelly & Voydanoff, 1985); work-family conflict (Voydanoff, 1982); perceived stress and control (Renshaw, 1979, Skinner, 1980); their ability to manage time (Hall & Hall, 1980); and life satisfaction (Benner, 1984, Hall & Hall, 1980, Bohen & Viveros-Long, 1981, Googins & Burden, 1987).

Gender and parental status are also included in the framework as moderating variables in the relationship between cellular telephone use and the ability to balance work and family demands. While no empirical work is currently available which examines gender or parental status differences in the link between cellular phone use and the ability to balance work and family demands, the available literature suggests that such differences may occur (i.e. Portner, 1983, Greenhaus, 1988, Greenhaus and Beutell, 1985, Gutek et al., 1981).

Research Questions and Hypotheses

In the sections which follow, the research questions and hypotheses of the study are developed. The chapter itself is organized around the research framework in Figure 1, with the first part focusing on motivations for using cellular technology and the second part examining the technology's potential capability to help employees balance work and family demands (i.e. affect individual, work and family consequences). The third part considers the effects of the moderating variables of gender, parental status, work and family demands.

It should be noted that theoretical development in this area has been limited and previous research results are inconclusive. Consequently, much of this work must be deemed exploratory. Hypotheses are, however, postulated where sufficient theory is available.

Motivations for Use

As outlined in Figure 1, one purpose of this research is to empirically determine what motivates people to use cellular telephone technology and whether these motivations affect the frequency of cellular telephone use. Informal user surveys in the popular press have concentrated mostly on increased productivity and the ability to better service clients (Gates, 1990, Dobbs, 1990, Smith, 1989, McLellan, 1989, Lewis et al., 1988, Gates, 1990, Lopez, 1989, Leitch, 1989) as the reasons people use cellular telephones. Only one article in this area has mentioned a reduction in a CTU's stress level (McLellan, 1989) as a possible motivation for cellular phone use.

A small amount of empirical research exists in this area. Three formal surveys by AT&T (Zey, 1986), Nynex (Yankelovich et al, 1991) and Motorola (Gallup, 1991) highlight the following major advantages of cellular telephones: (1) no wasted time looking for a telephone; (2) use of drive time to do business; (3) scheduling flexibility in order to maximize efficiency; (4) an increase in the amount of time available for work each day, ranging from one to four hours; (5) enhanced customer relations; and (6) improved personal and business efficiency and flexibility. These surveys conclude that people use cellular telephones to increase their work productivity and work satisfaction and decrease their overall stress.

This study attempts to empirically ascertain people's motivations for using a cellular telephone in order to provide a clear picture of the benefits that can be derived from this technology. To that end, the following related research questions are asked in this study:

- 1) What motivates people to use a cellular telephone?
- 2) Are these motivations related to the frequency of cellular telephone use?

The Impact of Cellular Phone Use on the Ability to Balance Work and Family Demands

In the past researchers tended to treat work and the family as separate spheres (Near, Rice & Hunt, 1980, Kopelman, Greenhaus & Connolly, 1983, Jackson, Zedeck & Summers, 1985). Research in either area neglected the effects that one had on the other. Recently, however, it has been shown that work and the family are highly interdependent (Burke & Bradshaw, 1981, Kopelman,

Greenhaus & Connolly, 1983, Staines & Pleck, 1984, Jackson, Zedeck & Summers, 1985, McRae, 1989). Both spheres place a considerable amount of strain on the individual as they compete for his/her time and energy. Workers under pressure at the office often bring their concerns home at night and this can create tension in the family unit. Conversely, spouses and parents are often unable to unload their family baggage while at work and allow concerns about children and relationships to intrude during the work day (McRae, 1989, Portner, 1983, Hall & Hall, 1980).

One of the most important tasks that a working individual has to accomplish is to achieve a balance between his/her work and family lives (Duxbury & Higgins, 1990A, Portner, 1983, Skinner, 1983, Kelly & Voydanoff, 1985, Hertz, 1986). This can be an extremely difficult undertaking and many people simply are not capable of dealing with this challenge. It is believed that cellular technology has the potential to be an important aid in this balancing process, and for this reason these vital issues form a major part of the research.

This research attempts to show that cellular technology has the ability to help people cope with the competing demands of work and family by increasing their control over work time and work location (Karasek, 1979). This proposition was tested by examining the relationship between cellular phone use and individual (perceived control and stress, life satisfaction, time management), family (family satisfaction, work-family conflict) and organizational (perceived work productivity, work satisfaction, work-family conflict) consequences which have been empirically linked to the ability to balance work and family. This

section reviews the literature pertaining to the individual, organizational and family consequences included in this study as measures of a person's ability to balance work and family: perceived work productivity, time management, perceived control, perceived stress, work-family conflict and work, family and life satisfaction.

Perceived Work Productivity

The closest body of academic literature from which the effects of cellular technology can be forecast is telecommuting, or the practice of substituting the home for the traditional office as a workplace (Nilles et al., 1976). The parallels between telecommuting and cellular phone use are that both give the worker the choice of fulfilling work demands outside of normal office boundaries (i.e. work time and location flexibility). Studies have shown that the use of telecommuting can result in increased productivity and reduced levels of stress (Kraut, 1989, Duxbury, Higgins & Irving, 1987). Similarly, informal user surveys and the AT&T study (Zey, 1988) confirm that one of the major reasons business people opt for cellular telephones is because they perceive that the technology will help them increase their work productivity.

Jarratt and Coates (1990) are enthusiastic on the subject of cellular telephones and work productivity. They foresee great increases in work productivity as employees increasingly become available, through the use of cellular technology, to work outside of normal office hours. According to the authors, people need no longer wait for cellular telephone users to arrive at their destinations for business to be conducted. Jarratt and Coates also believe that

cellular telephones will make certain business transactions easier and more frequent by allowing business people to be more spontaneous.

The Motorola survey (Gallup, 1991) indicates that a combination of improved flexibility and enhanced business and personal flexibility leads to a perception of improved productivity for cellular telephone users.

Based on the above literature and given equal work and family demands, it is hypothesized that:

H1: Perceived work productivity will be positively associated with frequency of cellular telephone use.

Time Management and Perceived Control

Karasek's theory (1979) of control over conflicting job demands can be applied when discussing the link between cellular technology and the ability to manage one's time and one's perception of control. Karasek proposed that similar jobs may differ substantially in the degree of conflict generated due in large part to the amount of control an individual has over the situation. A person who possesses a superior coping mechanism, for example a cellular telephone, has more control over his/her job demands by virtue of his/her increased work time and location flexibility. Renshaw (1979) similarly established that an individual's perception of control over stressful events is a key factor in coping successfully with stress.

Put in the context of Karasek's model (1979), workers with cellular phones should have greater flexibility with respect to work time and location. This increase in control over the execution of their job demands means that work and

family pressures should be easier to balance.

A study by Duxbury and Higgins (1990B) on the use of portable technology and supplemental home work as a substitute for overtime hours at the office is closer in nature to the impact of cellular technology than are most other studies of telecommuting. This study takes into account the influence of the technology as well as the work environment. Duxbury and Higgins found that having more control over the choice of work environment and the timing of work tasks resulted in decreased work and work-family conflict. The technology afforded users more flexibility and control over when and where they did their work and this helped them to better balance their work and family demands. The study strongly suggests that, due to their increased control, users of portable technologies are more prone to experiencing an increase in their work satisfaction than are non-users. The Duxbury and Higgins study closely parallels the current research in that cellular telephones are a portable technology which gives the user more control over time and place of work.

Empirical evidence also exists which suggests that individuals with cellular telephones will be better able to manage their time. Two of the benefits described in the AT&T study (Zey, 1988), use of drive time and scheduling flexibility, essentially translate into more effective time management capabilities. Jarratt and Coates (1990) also see cellular technology as a great time saver, particularly for working parents. To quote the authors:

"Cellular technology has the capability of easing time pressure by enabling users to do two things almost at once, as well as by eliminating many tasks that had to be done manually or by travelling to another site." (Jarratt and Coates, 1990, p. 84).

Finally, the Motorola survey (Gallup, 1991) found that cellular users were able to recover from one to four extra hours of time due to the advantage of instant communication. This added time to their day and enabled them to enhance their business and personal productivity.

The following hypotheses are tested in this research. Given equal work and family demands, it is postulated that:

- H2: Time management will be **positively** associated with frequency of cellular telephone use.
- H3: Perceived control will be **positively** associated with frequency of cellular telephone use.

Perceived Stress

Organizations are interested in the effects of stress because it can have a serious impact on an employee's ability to perform his/her job. For the employer, uncontrolled stress can result in high rates of absenteeism and decreases in productivity due to poor physical and mental health and job dissatisfaction (Cooper & Marshall, 1976).

According to Karasek's (1979) job strain model, given equal demands, increased control is linked to a decreased perception of stress. In other words, workers who feel they have more control over their work situations will experience lower levels of stress. If cellular telephones can increase an individual's ability to control his or her work and family demands, then use of the technology should result in a decreased perception of stress.

Support for this contention comes from a recent Gallup poll (1991). This study found that the increased flexibility and efficiency provided by the use of cellular telephones helped some users reduce their overall perceived stress.

Given equal work and family demands, the related hypothesis in this study is:

H4: Perceived stress will be **negatively** associated with frequency of cellular telephone use.

Work-Family Conflict

This study looks at whether cellular technology makes it easier for an employee to manage conflicting work and family demands. According to empirical research, major sources of work-family tension are: spending an excessive amount of time pursuing work-related activities; incompatibilities between work and family schedules; and the spillover of work into the family arena (Kelly & Voydanoff, 1985, Kanter, 1984, Staines & Pleck, 1984, Bartolome, 1983, Hall & Hall, 1980, Hall & Hall, 1978). These lead to two underlying sources of work-family conflict: role interference and role overload.

Interference exists when the demands of work and family conflict with each other and the individual cannot successfully fulfill his/her multiple roles (Voydanoff, 1982, Greenglass, Pantony & Burke, 1988). According to Hall and Richter (1988), role interference is especially dangerous as employees need a distinct separation of work and family in order to avoid symptoms of burnout. Overload is the case where the total demands of both work and family exceed the individual's time and energy constraints (Rapoport & Rapoport, 1969,

Voydanoff, 1982, Duxbury & Higgins, 1990A)

Use of a cellular telephone may increase role overload by making it easier for an individual to perform overtime work. Alternatively, it may decrease role interference by making it easier for an employee to fit work in around family activities. The second contention is supported by Karasek's (1979) research (i.e. greater control over both time and work location should allow one to decrease conflict). Given equal work and family demands, it is postulated that:

H5: Work-family conflict will be **negatively** associated with frequency of cellular telephone use.

Work Satisfaction

Empirical evidence suggests that employees who are faced with the pressure to be more productive at work and who are not given any added assistance with, or control over, their work demands, are more likely to suffer a decrease in their work satisfaction (Karasek, 1979, Googins & Burden, 1987).

On the other hand, the literature suggests that workers who have an increased ability to cope with the conflicting demands of work and family will experience greater overall satisfaction in their jobs (Duxbury & Higgins, 1990B, Pierce et al., 1989). If the cellular telephone does indeed help an employee to coordinate work and personal activities in a manner such that the two do not interfere with each other (i.e. by helping one perform the demands at a more convenient location and time of day) its use should be associated with greater work satisfaction. Given equal work and family demands, the relevant hypothesis is:

H6: Work satisfaction will be **positively** associated with frequency of cellular telephone use.

Family Satisfaction

Empirical evidence indicates that employees who have difficulties balancing work and family demands often give priority to work roles as it is often easier to work more overtime hours to satisfy job demands (Duxbury & Higgins, 1990A). Family satisfaction suffers in such an environment as an overloaded and stressed individual is usually incapable of adequately supporting his/her family unit or devoting sufficient time to family role demands (Rapoport & Rapoport, 1969).

Other research has found that family satisfaction will be enhanced if individuals are able to better handle their job demands (Jackson, Zedeck & Summers, 1985). Spillover from work to family is the condition where positive or negative aspects of a job affect family life (Voydanoff, 1987). For example, a satisfied and stimulated worker will transfer these attributes to the home setting in the form of a higher energy level and increased satisfaction. Conversely, negative spillover occurs when problems and stress at work interfere with the individual's ability to adequately participate in family life.

If cellular telephones do in fact help employees cope with conflicting work and family demands, cellular phone use should be negatively associated with role overload and interference and positively associated with satisfaction with the family domain (Hall & Hall, 1980). The following related hypothesis is tested in this analysis. Given equal work and family demands, it is postulated that:

H7: Family satisfaction will be **positively** associated with frequency of cellular telephone use.

Life Satisfaction

With the sometimes overwhelming demands of career and family, it is not surprising that many people besieged with these multiple responsibilities experience a decrease in work and family satisfaction. Work by Near, Rice and Hunt (1978) has found that overall life satisfaction also decreases under these conditions since life satisfaction is largely determined by levels of job and family satisfaction. This theory gives rise to the following hypothesis. Given equal work and family demands it is postulated that:

H8: Life satisfaction will be **positively** associated with frequency of cellular telephone use.

Moderating Variables

Four moderating variables (see Figure 1) are included in the analysis: parental status, gender, work demands and family demands. Relevant literature is reviewed below.

Parental Status

Clearly, people in the work force today have a great deal to contend with, not the least of which is the ability to balance work and family demands. Being a parent definitely adds to the potential for strain and conflict, if for no other reason than the fact that parents simply have more family demands to fulfill (Kelly & Voydanoff, 1985).

The addition of new and different responsibilities changes people's priorities, (Brett & Yogev, 1988), the way they live their lives and how they feel (Portner, 1983, Holahan & Gilbert, 1979). The increased family demands often mean that parents are more in need of coping mechanisms than non-parents. There is no empirical or theoretical literature which would allow the statement of parental differences a priori. Consequently, the following research questions are tested:

- 3) Does parental status make a difference as to why people elect to use a cellular telephone?
- 4) Does parental status act as a moderating variable in the relationships tested in the framework between frequency of cellular telephone use and the ability to balance work and family?

Gender

Another moderating variable in the framework is gender. Researchers have clearly shown that, all other things being equal (children, marital status, socioeconomic status, etc.), there is a difference between the sexes in the amount of experienced role overload and interference. Women have considerably more difficulty balancing work and family demands than men since they are usually more responsible for household management and child care (Greenglass, Pantony & Burke, 1988, Googins & Burden, 1987, Hertz, 1986, Bohen & Viveros-Long, 1981, Rice, 1979, Pleck, 1977).

Women who have children usually find it more difficult to co-ordinate work and family than their counterparts with full-time jobs since they often lack

the necessary support services such as full-time child care and household help. Furthermore, women are often expected to disrupt their work lives in order to deal with family problems, yet they face considerable pressure to avoid doing this in their work environments (Pleck, 1977, Mortimer & London, 1984). According to Hall and Richter (1988), women's work and family demands are simultaneous while men's are sequential. This means that women are expected to fulfill their work and family roles at the same time, i.e. they have to deal with family problems during the work day. Men, on the other hand, are allowed to compartmentalize their work and family responsibilities, i.e. the two domains do not interfere with each other. Family problems are usually only dealt with after the work day is over.

The gender differences in family demands and expectations which characterize many North American families suggests that men and women will have different reasons for adopting cellular telephone technology. Gender could also have an impact on the relationship between cellular telephone use and the ability to balance work and family.

Again, a lack of relevant literature in this area makes it impossible to make a statement of gender differences a priori. The following research questions are tested:

- 5) Do gender differences exist as to why people elect to use a cellular telephone?
- 6) Does gender act as a moderating variable in the relationships tested in the framework between frequency of cellular telephone use and the ability to

balance work and family?

Work Demands

The Gallup Organization (1991) found that the use of a cellular telephone increases the amount of time available each day to deal with work demands. According to Karasek (1979), such an increase in time can help to improve a worker's productivity and reduce his or her stress. This research examines whether workers with different levels of work demands (from low to high) have different motivations for adopting cellular telephones.

The literature also suggests that work demands will moderate the relationship between organizational, family and individual consequences and the use of a cellular telephone. Employees who are unable to cope with high work demands often experience decreased work satisfaction (Pierce et al., 1989), family satisfaction (Jackson, Zedeck & Summers, 1985) and, by extrapolation, life satisfaction (Near, Rice & Hunt, 1980). It is logical to assume, then, that raising or lowering an individual's work demands will have an impact on the quality of his/her life.

The following related questions are addressed in this thesis:

- 7) Do work demands influence why people elect to use a cellular telephone?
- 8) Do work demands act as a moderating variable in the relationships tested in the framework between frequency of cellular telephone use and the ability to balance work and family?

Family Demands

The literature also suggests that family demands will have an impact on why an individual adopts cellular phone technology and the extent to which it helps them balance work and family demands. A person with high family demands often has a greater need for some sort of coping mechanism to help them balance work and family. Family demands which have been found to be related to the ability to effectively balance competing demands include the number of children in the home and how involved the parent is with the children's lives (Yogev & Brett, 1985). In addition, Voydanoff (1987) relates that the type of demands placed on the parents varies with the age of the children. For example, new parents who are involved in the early stages of their careers will need a great deal of time, attention and energy to devote to their children while parents with older, school-aged children will have more scheduling conflicts. Other family demands include responsibility for maintenance of the home and other tasks connected to the family's upkeep, including shopping (Voydanoff, 1987).

The dearth of previous research in this area makes it impossible to postulate the impact of family demands a priori. Consequently, the following research questions are asked:

- 9) Do family demands influence why people elect to use a cellular telephone?
- 10) Do family demands act as a moderating variable in the relationships tested in the framework between frequency of cellular telephone use and the ability to balance work and family?

Methodology

This chapter reviews the methodology which was employed for the research. The first section discusses the sample, the second section looks at the survey instrument, the third section reviews the survey measures and the fourth section explains the data techniques which were employed for all the analyses.

The Sample

The sample consisted of 3,160 randomly selected cellular telephone users chosen from Cantel's (a Canadian-based cellular telephone network company) population of subscribers and broken down as per Figure 2. Five hundred and twenty-five (525) questionnaires were returned for a response rate of 16.6%. It was felt that the response rate would have been higher had a report of the results been offered to the respondents. Due to time and budgetary constraints, however, this option was not available.

Cantel's database was not able to distinguish between male and female cellular subscribers. In order to obtain the sample, 35,000 names were selected at random and then categorized by gender using a computer program based on a list of Canadian baby names. The unknown category represents those names which the computer was unable to classify by gender (see Figure 2). Unfortunately, the computer was more successful at classifying women than men. It was felt, however, that the unknown category would most likely reflect the overall cellular population of ninety-two percent men and eight percent women. Therefore, candidates from that category were selected in order to make up for

	Men	Women	Unknown
Western Canada (24%)			
Very Heavy	0	38	38
Heavy	0	62	62
Medium	0	112	112
Light	0	167	164
Sub-total	0	379	376
Ontario (40%)			
Very Heavy	15	62	47
Heavy	15	93	77
Medium	125	171	45
Light	275	350	0
Sub-total	430	676	169
Quebec French (18%)			
Very Heavy	14	28	14
Heavy	20	50	23
Medium	20	81	61
Light	20	143	106
Sub-total	74	302	204
Quebec English (06%)			
Very Heavy	0	13	13
Heavy	0	18	17
Medium	29	30	0
Light	40	40	0
Sub-total	69	101	30
Atlantic Canada (11%)			
Very Heavy	12	18	9
Heavy	7	20	35
Medium	14	37	59
Light	10	41	88
Sub-total	43	116	191

Grand Total **616 + 1574 + 970 = 3160**

Figure 2 - Breakdown of Sample

the shortfall in the male category as it was assumed that most of the unknowns would be men.

The regions of West, Ontario, Quebec and Atlantic represent the four main geographical areas covered by Cantel's cellular telephone service. Quebec is further split into French and English for billing purposes. The four designations of very heavy, heavy, medium and light users are further explained in the section on specific survey measures.

Each questionnaire was numerically coded on the top left-hand corner with a three-digit number representing region, gender and frequency of use. This allowed the number of questions to be reduced and guaranteed the accuracy of the answers since, for these variables, it was not necessary to rely on the respondents. A gender question was asked in the demographic section of the questionnaire in order to classify the unknowns as either men or women.

The regional breakdown reflects the cross-country make-up of Cantel's customer database. It should be noted that to ensure an adequate number of women cellular users in the final analysis, they were purposely over-sampled. At the time of the mailing, women only accounted for about eight percent of the entire cellular subscriber population. Fortunately, however, they managed to account for 50% of the survey respondents. In keeping with the goals of the research, all the analyses were done separately for men and women and the results were compared to see if there were any differences. Because of this, it was possible to generalize the result to Canadian female and Canadian male cellular subscribers at large.

Individuals surveyed were chosen based on the length of their subscribership, with the time period set at six months to one and one half years. This time period was selected for three reasons. First, it was assumed that respondents would not remember their pre-phone days past one and one half years. Second, it was felt that those who had had the phones less than six months would not have felt its full impact yet. Finally, while one and a half years was a fairly long period for recall data, it would not have been possible to obtain the desired sample without going back that far.

The Survey Instrument

The eight page instrument consisted of thirty-four questions. Virtually all the constructs in the model (except motivations) were operationalized using standard scales from the literature. The questionnaire is included in Appendix 2. The measures used are summarized in Figure 3. To increase the response rate, a pre-test of the survey instrument was done on eight people in order to determine its validity.

The questionnaire took no longer than twenty minutes to complete. It was translated, printed and distributed by Cantel. Reminder cards were sent out two weeks after the initial survey in order to boost the response rate.

Specific Survey Measures

This section lists the specific items which were used in the questionnaire. An explanation is provided as to why each item is included and what type of information was desired from the respondents. It should be noted that time constraints necessitated the deletion of several questions from four of the scales.

<u>Survey Measure</u>	<u>Source</u>
Motivations (Q1-Q4, Q6, Q8, Q10)	Adapted from Duxbury & Higgins (1990B)
Frequency of Use (Q2, 8-11, H1-H8) - Objective & Subjective	Cantel
Work Demands (Q6, 8-11, H1-H8) - Involvement - Hours in role	Lodahl & Kejner (1965) Duxbury & Higgins (1990B)
Family Demands (Q7, 8-11, H1-H8) - Involvement - Hours in role	Yogev & Brett (1985) Duxbury & Higgins (1990B)
Perceived Work Productivity (Q8-11, H1)	Adapted from Duxbury & Higgins (1990B)
Time Management (Q8-11, H2)	Bohen & Viveros-Long (1981)
Perceived Control (Q8-11, H3)	Pearlin (1983)
Perceived Stress (Q8-11, H4)	Cohen et al. (1983)
Work-Family Conflict (Q8-11, H5)	Bohen & Viveros-Long (1981)
Job Satisfaction (Q8-11, H6)	Quinn & Staines (1979)
Family Satisfaction (Q8-11, H7)	Moos et al. (1983)
Life Satisfaction (Q8-11, H8)	Diener et al. (1985)

Figure 3 - List of Survey Measures

Most of the questions which were deleted were similar to questions that were already being included in others parts of the questionnaire. The deletions are noted in the appropriate areas of this section and the scales are reproduced in their entirety in Appendix 3.

The measure for motivation used in this study was an adaptation of Duxbury and Higgins's (1990B) measure and was expanded using information gathered through telephone interviews with cellular subscribers. This was necessary as no suitable motivation measure existed at the time of the survey.

Frequency of Cellular Telephone Use

Frequency of use was measured by accessing monthly billing records from Cantel's database. The questionnaires were then numerically coded according to four categories: Very Heavy (500+ minutes/month), Heavy (200-499 minutes/month), Medium (100-199 minutes/month) and Light (15-99 minutes/month).

Work and Family Demands

Physical and psychological measures were used in order to get a multi-dimensional picture of the work and family demands of each of the respondents.

Psychological work demands were measured using a five-point work involvement (Lodahl & Kejner, 1965) scale which included 3 questions testing users' degree of involvement with their jobs (split-half reliability between .72 and .89, $\alpha = .77$ to .83). A high score indicates that the respondent is highly involved with his or her job. Physical work demands were measured by the number of hours worked per day on job related tasks.

Physical family demands were measured by asking respondents to indicate the number of hours spent on home chores and family related activities. A psychological family involvement scale from Yogeve and Brett (1985) asked respondents to rate statements such as "I am very much involved personally with my family members' lives". This was a five-point scale with $\alpha = .72$ to $.88$. A high score indicates high family involvement.

Physical work and family demands were collected for both an average work day and an average day-off. For the data analyses, physical work demands on an average work day and day-off were summed. The same procedure was used for the physical family demands.

Motivations to Use a Cellular Telephone

The measure used in this study was adapted from Duxbury and Higgins (1990B). Telephone interviews with ten male and ten female cellular subscribers were conducted with the respondents being asked to list their reasons for using a cellular telephone. The data was used to develop a motivation measure specifically related to cellular telephone usage.

The final measure consisted of a five-point scale with fourteen questions. Respondents were asked to indicate the extent to which they agreed with each of the reasons for using a cellular telephone (reproduced in Figure 4). A high score indicates that the respondent is in agreement with the statement.

Perceived Work Productivity

Few established measures exist for work productivity. Three questions, two of which were adapted from Duxbury and Higgins (1990B), were used in this study. The first question asked users to estimate, on a five-point scale, whether their work productivity had increased or decreased since they started using a cellular telephone. A high score indicates a perceived increase in work productivity.

Two other questions (on a five-point scale) were combined to form a second measure of perceived work productivity. One of these asked respondents to indicate whether they perceived that their average output at work had increased or decreased since they had started to use the cellular telephone (Duxbury & Higgins, 1990B). A second question asked respondents to estimate whether they perceived that their actual number of work hours had increased, decreased or stayed the same since they started using a cellular phone. This last question was reverse-coded and combined with the question on average output to form a composite scale. It was assumed that if a respondent indicated that his or her average daily output had increased, and the number of hours spent at work had decreased, since they began using a cellular telephone for work, then the respondent had experienced an increase in perceived work productivity. In other words, a high score on the composite measure indicates that perceived work productivity has increased.

Time Management

A five-point time management scale (Bohen & Viveros-Long, 1981) rated the respondents' ability to find time for specific activities, including household chores, shopping and family activities (15 questions). The Cronbach α coefficient for this scale was .93 with a high inter-item reliability. A high score indicates good time management. Six questions from the original scale were not used (see Appendix 3).

Perceived Control

The five-point perceived control scale (Pearlin & Schooler, 1978) rated the respondents' degree of agreement on seven questions which examined the extent to which they perceived themselves as being in control of their lives. It included items like "Sometimes I feel that I'm being pushed around in life," and "I have little control over the things that happen to me". A high score indicates a high level of perceived control.

Perceived Stress

The five-point perceived stress scale developed by Cohen, Kamarck and Mermelstein (1983) was used in this analysis. This scale had high internal consistency and test-retest reliabilities for brief intervals as well as a Chronbach's α rated at between .84 and .86. A short form of the measure which excluded ten questions from the original scale was used (see Appendix 3). Two questions dealing with the respondent's confidence concerning his or her personal problems and if the respondent felt that things were going his or her way were reverse coded. A high score indicates a high level of perceived stress.

Work-Family Conflict

Work-family conflict was measured using the five-point job-family role strain scale developed by Bohlen and Viveros-Long (1981). The Cronbach's α coefficient for this scale was .71. Ten questions from the original scale were not used (refer to Appendix 3). A high score indicates a high level of work-family conflict.

Work Satisfaction

Work satisfaction was determined using a five-point scale from Quinn & Staines (1979). The internal consistency for this scale was rated at .85. A high score indicates a high level of work satisfaction.

Family Satisfaction

Family satisfaction was determined by 2 five-point questions from Moos et al. (1983). The Chronbach's α was between .72 and .76. A high score indicates a high level of family satisfaction.

Life Satisfaction

Life satisfaction was measured using a five-point scale from Diener, Emmons, Larsen and Griffin (1985). This measure had a Chronbach's α coefficient of .87. A high score indicates a high level of life satisfaction.

Data Analysis

As shown in the theoretical framework (Figure 1), this study has two main objectives: (1) to look at what motivates individuals to use cellular telephones, and (2) to attempt to understand what impacts use of a cellular telephone has on the users. The first part of this section looks at the techniques that are used to characterize the sample, the second part summarizes the techniques that are used to examine the motivations for use and the third part focuses on the methods used to examine the ability of cellular telephone users to balance work and family. All the data analysis techniques are summarized in Table DA-1 at the end of this section.

Analysis of Demographic Characteristics

As a first step, descriptive statistics were calculated on the characteristics of the respondents. The following breakdowns were performed: country region, age, frequency of use, marital and parental status, responsibility for child care, income, company size, professional status, education, occupation and use of the cellular telephone for work and during the daily commute.

As one intent of the research is to examine the differences between men and women cellular users, demographic breakdowns are provided by gender. Chi-square tests were done in order to determine if any demographic differences between the genders were statistically significant.

Analysis of Motivations for Cellular Telephone Use

The motivations for using a cellular telephone, reproduced in Figure 4, cover a wide range of topics. The main question they were designed to measure

is: Why do people choose to use a cellular telephone? As a first step, separate frequencies were tabulated for each of the fourteen motivation items.

In order to derive as much information as possible from each set of answers, the discussion for question one is based on the separate frequencies and not the means of each motivation. This was done because it was felt that only using summary measures does not provide as clear a picture of the results. Means are, however, reported in the results tables.

The five-point measurement scale (1=strongly disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=slightly agree, 5=strongly agree) was collapsed into three categories of agree (combination of 4 and 5), neutral (3) and disagree (combination of 1 and 2). It should be noted that this is the only time that the original five-point scale was collapsed into three groups. It remained in its initial state for all the other analyses.

Conclusions were drawn based on what proportion of respondents fell into each of the three groups. When a majority of respondents agreed with a particular motivation it was concluded that the motivation was an important reason to adopt the cellular telephone. Where no clear majority existed, the respondents were categorized as neutral concerning the importance of the motivation. In addition, the motivations were ranked in importance from one to four, based on the respondents' level of agreement. A ranking of one indicated that 75% or more of respondents agreed with the motivation. A two meant that between 50% to 75% (≥ 50 , < 75) agreed, a three meant that 25% to 50% agreed (≥ 25 , < 50) and a four indicated that less than 25% of the respondents agreed

"I use a cellular telephone because:"

- M1) It gives me more control over when and where I do my job.
- M2) It gives me a faster turnaround time on my work.
- M3) I am encouraged by my boss and/or colleagues to use the cellular telephone to improve the performance of my job.
- M4) I am encouraged by my spouse to use the cellular telephone so I can avoid overtime at the office.
- M5) It helps me balance the conflicting demands of work and home.
- M6) Having the phone with me gives me a feeling of safety and security.
- M7) It allows me to stay in touch with my clients.
- M8) It allows people to reach me wherever I happen to be.
- M9) I can rearrange my work schedule in the event of last minute changes.
- M10) It helps me to remain competitive with others in my industry.
- M11) It helps me in scheduling my free time (e.g. dates, friends).
- M12) It helps me to manage my family life.
- M13) I can keep in contact with my children's school or daycare/ babysitter during the day.
- M14) I feel that it enhances my status among my colleagues and friends.

Figure 4 - Motivations for Using a Cellular Telephone

with the motivation for using a cellular telephone. These rankings were done in order to facilitate interpretation of the motivations. In order to determine if there were significant differences between men and women, t tests were also run for each motivation.

Multivariate analysis.

A multivariate approach was selected for the other research questions which dealt with motivations for cellular telephone use (questions two, three, five, seven and nine). Multivariate instead of univariate techniques were used in analyzing the motivations because, according to Stevens (1986):

- the probability of a Type I error, which is the chance of falsely rejecting the null hypothesis, is precisely controlled;
- univariate tests do not take correlations between the variables into account; and
- when tested as a group, the variables might be responsible for significant differences, even if they are not when tested on their own.

For the multivariate analysis, the fourteen motivations were broken up into a number of a priori groups instead of being analyzed as one multivariate group. This decision was based on Stevens' (1986) reasoning that:

"If several of the variables have been included (in a multivariate analysis) without any strong rationale (empirical and/or theoretical), then small or negligible differences on these variables may obscure a real difference(s) on some of the other variables." (p. 115)

Other reasons for grouping the variables included the need to maintain power at a reasonable level so that conclusions could be made at a reasonable level of confidence, and the fact that grouping the motivations along the lines of specific constructs (i.e. job, family) made the results easier to interpret.

The a priori motivational groups were based on the theoretical foundations of the study which was designed to look at the personal, work and family conse-

quences of using a cellular telephone. To that end, the motivations were placed into the following three groups:

- Job:**
 - M1 - More job control
 - M2 - Faster turnaround time
 - M7 - Stay in touch with clients
 - M9 - Rearrange work schedule
 - M10- Remain competitive
- Family:**
 - M5 - Balance work and family
 - M12- Manage family life
- Personal:**
 - M6 - Safety and security
 - M8 - People can reach me
 - M11- Schedule free time

Pearson Correlation Coefficients showed that the motivations which were grouped together were highly correlated (the coefficients are reproduced in Appendix 4). High intercorrelation, according to Stevens (1986), can be used as a fairly strong justification for including dependent variables together in a multivariate analysis.

Four motivations were analyzed separately. These questions remained separate for various reasons. The motivations of spousal encouragement (M4) and contacting a child's caregiver or school during the day (M13) were considered to be "structural missings". In other words, they could only be answered by respondents who had spouses and/or children. They could not, therefore, be included in analyses which covered the entire sample.

The motivation of encouragement by a boss and/or colleagues (M4), while highly correlated to the other job-related motivations, did not elicit very many responses. When used in a multivariate analysis, it reduced the number of cases to an unacceptable level. This problem was avoided by analyzing this question

separately. The motivation of status enhancement (M14) had a similar effect on the personal-related a priori group. It was also analyzed separately.

MANOVA

MANOVA was the main technique used in the analysis of the second, third and fifth research questions which dealt with the impact of frequency of use, gender and parental status on motivations. This technique simultaneously compares two or more groups of subjects on several dependent variables and determines if there were any statistically significant differences between the groups (Stevens, 1986, p. 149).

Before the MANOVAs can be considered statistically accurate, several assumptions have to be satisfied (Stevens, 1986). First, all the observations have to be independent of each other so that the respondents do not have the opportunity to influence each other's scores. This assumption was taken care of by the random selection procedure used to extract the sample from the Cantel database.

Second, the distributions of the variables have to conform to multivariate normality. This involves examining the distributions of each of the fourteen motivations and determining if the skewness and kurtosis coefficients show significant deviations from the normal curve. To satisfy this assumption, variables that showed extreme non-normality (motivations two, seven, eight and nine were all negatively skewed) were transformed using the reflect and inverse data transformation for j-shaped, negatively skewed distributions which is described in Tabachnick and Fidell (1983).

Motivations one and six were also negatively skewed but not as severely as the other motivations. They were transformed using the reflect and square root procedure (Tabachnick & Fidell, 1983). Histograms showing the distributions for these motivations before and after the transformations are reproduced in Appendix 5.

It should be noted that the reflect and square root procedure performed on motivations one and six had the effect of reversing the distribution so that the highest scores became the lowest scores and vice versa. For example, a five became a one and a one became a five. This meant that any significant results connected with these motivations had to be interpreted following the variable's original direction. For example, if the results of the analysis showed that motivation one was negatively associated with another variable, this had to be reversed and interpreted as a positive association. In order to clarify any confusion that might result from this requirement, the reversal of direction is clearly indicated in relevant sections of the thesis. To further help the reader, the Pearson Correlation Coefficients for the original untransformed variables are provided to show the true direction of the relationships. Appendix 6 contains plots of all the original versus the transformed variables in order to graphically depict the change in the direction of the relationships.

The final assumption is the homogeneity of the covariance matrices. Since this assumption is difficult to satisfy in practice (Stevens, 1986), it is more relevant to consider what effect violations of this assumption have on the results. The Box's test which was used to check this assumption was, in general, not

significant.

In the few cases where the Box's test was significant, the homogeneity assumption could still be considered tenable since the test statistic was considered to be overly conservative (i.e. the group sizes were all approximately equal (largest/ smallest < 1.5) and the larger variance was always found to be with the larger group size). In any case, Stevens (1986) has found that Wilk's Lambda and Hotelling's T^2 are quite robust against this type of violation.

According to Stevens (1986), it is necessary to have significance at the multivariate level before checking the univariate results. This avoids the interpretation of spurious results which may be caused by capitalization on chance due to the large number of tests being conducted. Multivariate significance of group differences was checked using Hotelling's T^2 at $\alpha = .05$. If the results were found to be significant and no interactions were present among the multiple factors, then two post hoc procedures were performed in order to determine which of the variables were contributing to the overall difference.

First, univariate tests at $\alpha = .05$ were examined for each of the dependent variables. According to Stevens (1986), as long as the number of variables is reasonably small, power should be maintained and there should be fairly good protection against Type I errors. This was accomplished through the use of the a priori job, family and personal motivational groupings.

Discriminant Analysis.

Unfortunately, the univariate tests were only able to indicate which dependent variables in the a priori groupings were responsible for group dif-

ferences. A second procedure, Discriminant Analysis was used to determine the relative importance of each of the dependent variables to group differentiation (Stevens, 1986). The method described in Thomas (1990) of multiplying the standardized discriminant function coefficients by the structure coefficients (the correlations between the dependent variable and the discriminant function) was used to rank the importance of each variable within the a priori motivational group. In addition, the group centroids (means) of the independent variables were plotted in order to determine the importance of the discriminating motivations to each group.

Only significant discriminant functions were reported in this analysis. Box's test for homogeneity of variance was also checked and, as with MANOVA, was either not statistically significant or was deemed to be conservative and not a cause for concern.

3X2 MANOVAs (grouped variables) and 3X2 ANOVAs (non-grouped variables) were done to answer questions two, three and five: [Frequency of Use by Gender] and [Parental Status by Gender]. The results for question five (do gender differences exist as to why people use cellular telephones) include the main gender effect figures from all the MANOVAs and ANOVAs.

Moderating variables.

The grouping variables used in the MANOVAs and ANOVAs were frequency of use (question two), parental status (question three) and gender (question five). The database was divided into male and female groups using the gender question (#20) on the questionnaire. The other two grouping variables

were formed as follows. For frequency of use, very heavy and heavy were combined because the respondent database did not include enough very heavy users for this category to stand on its own in factorial MANOVAs/ANOVAs ($N=43$). All the analyses dealing with frequency of use, therefore, were based on three groups: heavy, medium and light.

The respondents' parental status was determined by calculating the number of children per respondent. If the number was zero, the respondent was considered to be a "non-parent" and if the total was greater than zero the respondent was considered to be a "parent". The results of analyses using these groupings had to be interpreted cautiously, however, as they included data on parents of children over the age of nineteen who were not considered caregivers or financial supporters. This was, however, only a small percent (36%) of the sample and, therefore, not felt to be a matter of major concern.

MANCOVA.

MANCOVA was the main multivariate technique used in the analysis of the seventh and ninth research questions which dealt with the impact of work and family demands on motivations for using a cellular telephone. This technique is identical to MANOVA in that it simultaneously compares two or more groups of subjects on several dependent variables. The main difference is that it also partials out the effects of one or more continuous variables, called covariates, on the dependent variables. In doing so, it is able to indicate what effect the covariates are having on the dependent variables. The same assumptions from MANOVA also apply to MANCOVA with one addition, the

homogeneity of the regression hyperplanes. This, essentially, is a test to determine if there is an interaction between the covariates and the independent, or grouping variables. It must be non-significant or the use of covariates is considered to be inappropriate for the analysis (Stevens, 1986, Tabachnick & Fidell, 1983).

As with the MANOVAs, the MANCOVAs were first checked for multivariate significance of the regressions using Hotelling's T^2 at $\alpha = .05$. If the multivariate results were found to be significant and no interactions were present among the covariates and the grouping variables, then Canonical Correlation or Multiple Regression was performed in order to examine the relationship between the dependent variables and the covariates. If significant multivariate gender differences were found, separate Canonical Correlations or Multiple Regressions were done for men and women.

It should be noted that, ordinarily, Canonical Correlation or Multiple Regression would have been the only techniques used for this type of analysis since these techniques were specifically designed to look at the relationships between continuous variables such as the motivations and work and family demands. Gender, however, is a categorical variable and required the use of a technique like MANCOVA that could look at the difference between two or more groups.

Canonical Correlation.

Several assumptions had to be satisfied before the results of the Canonical Correlations could be interpreted (Tabachnick & Fidell, 1983). First, the

assumption of multivariate normality was tested by requesting normal and residual plots. No obvious violations were noted in any of the cases (please recall the data transformations already done on some of the motivational variables in order to make them conform to this assumption in the earlier MANOVA analysis). Considering the large sample size and the fact that most of the variables were minimally skewed, multivariate normality could be more or less assumed. The residual plots also indicated that the assumption of linearity was not violated and that outliers were not a problem.

Canonical Correlation also requires that none of the variables be too highly correlated with each other (multicollinearity). Since calculation of the canonical variates requires inversion of the correlation matrices, variables that are highly correlated with each other could cause the matrix determinant to approach zero and thus render the analysis unstable (Tabachnick & Fidell, 1983). Pearson Correlation Coefficients (reproduced in Appendix 4) were used to check this assumption. The data indicated that none of the variables were correlated above $r = .55$.

Finally, it was felt that there should be at least twenty cases per variable in order to draw solid conclusions based on one canonical function (Tabachnick & Fidell, 1983). This assumption was satisfied for all the analyses in this thesis.

After the assumptions were satisfied and if the dimension reduction analysis showed one or more of the Canonical Correlations to be significant at $\alpha = .05$, the correlations for those functions were examined along with the standardized canonical coefficients.

The Canonical Correlations in this thesis were interpreted using a combination of the approaches described in Stevens (1986) and Tabachnick and Fidell (1983). First the correlation of each variable to the function was examined. If this correlation was over .30, the variable was included in the preliminary results. The .30 level was chosen because, according to Tabachnick and Fidell (1983), this cut-off point ensured that the variable was responsible for at least 10% of the variance in the canonical function. This was considered to be an adequate level for social science research.

The standardized coefficients of the chosen variables were then reviewed and if they were all at more or less the same level, these variables were considered to be the ones defining the canonical function. If, on the other hand, some of the highly correlated variables had coefficients that were small (approximately half the size or smaller) in comparison to the other highly correlated variables, then they were considered to be redundant to the canonical function.

The logic behind this procedure is that the standardized coefficients are really partial coefficients with the effects of the other variables removed. They indicate the contribution of that variable to the overall linear combination. Even if the variable is highly correlated to the function, if it is not contributing much variance then it is redundant (Stevens, 1986).

For example, if the correlations of a canonical function composed of X, Y and Z were .85, .90 and .78, then all of these variables would initially have been considered as defining the canonical function. But if their standardized coefficients were $X = .85$, $Y = .38$ and $Z = .70$, then Y would most likely have been

rejected as redundant since it was contributing very little unique information to the overall function.

It should be noted that since Discriminant Analysis is really a sub-method of Canonical Correlation, it would have been logical to use the Thomas (1990) technique of multiplying the canonical correlations by the standardized coefficients in order to determine and rank the importance of each variable to the equation. Unfortunately, this approach to Canonical Correlation has never been empirically tested.

As it was not the purpose of this thesis to perform such validations, the Thomas ranking technique was not used. Since it has obvious applications in this area, it is hoped that future research will be done which will allow it to be applied to Canonical Correlation in order to facilitate the interpretation of the complex linear combinations which result from this multivariate technique.

Multiple Regression.

As mentioned above, four of the motivations, M3, M4, M13 and M14 were not part of a priori groups. This made them ineligible for analysis by Canonical Correlation, which is a multivariate technique. Multiple regression was used instead.

As with the other methods of analysis, certain assumptions had to be satisfied before one would have confidence in the findings. The first assumption, that the independent variable to subject ratio had to be no greater than one to five was easily satisfied. For all four of the individual motivations, the ratio was never lower than one to twenty-five. Normal probability and residual plots

showed that the assumptions of normality, linearity and homoscedasticity were satisfied and there were no outliers. Finally the assumption of multicollinearity was also satisfied as it was for the Canonical Correlations.

After checking the assumptions, the individual R-squared values for each of the work and family demands were calculated in order to determine which ones were contributing the most variance to the dependent variables.

Moderating variables.

Work demands consisted of two measurements, one physical and the other psychological. The physical demand of total work hours was calculated by summing the total number of hours spent on work-related tasks on an average work day and an average day-off. A work involvement scale was used to determine the respondents' psychological demands in this area.

Family demands also consisted of a physical and a psychological measure. The total number of family hours (physical demand) was calculated by summing the total number of hours spent on household chores and children's activities on an average work day and an average day off. This composite scale was slightly positively skewed and was normalized using the square root transformation (Tabachnick & Fidell, 1983).

The family involvement scale, which was used as the psychological measure of family demands was negatively skewed. It was transformed using the reflect and log procedure (Tabachnick & Fidell, 1983). As noted previously, this procedure resulted in a reversal of the scale on which the distribution was measured. Similar to motivations one and six (described above), any results

connected with family involvement had to be interpreted taking the original direction of the relationships into account. To facilitate these interpretations, the Pearson Correlation Coefficients for the original untransformed relationships are provided alongside any significant results concerning family involvement. In order to illustrate this change in direction, a plot of the original variable versus the transformed variable is provided in Appendix 6.

Analysis of the Ability to Balance Work and Family

The discussion on techniques and variables provided in the previous sections also applies to the analysis of the ability to balance work and family. Only new information which is relevant to this analysis is presented.

The perceived consequences (listed in Figure 5) were analyzed in a multivariate manner similar to that of the motivations. In order to avoid potentially spurious results, all the consequences, except family satisfaction, were analyzed as one a priori group (Stevens, 1986). The response rate to these questions was high enough to ensure an adequate number of cases for the multivariate analyses.

Family satisfaction was analyzed separately because it was a "structural missing" variable (i.e. respondents had to have either a spouse and/or children in order to answer this question).

A transformation of the distribution for family satisfaction was used in the analyses since the original variable was negatively skewed (Tabachnick & Fidell, 1983). The reflect and square root procedure resulted in a reversal of the distribution's measurement scale. Again, this meant that any significant results

* Perceived Work Productivity	* Work-Family Conflict
* Time Management	* Work Satisfaction
* Perceived Control	* Family Satisfaction
* Perceived Stress	* Life Satisfaction

Figure 5 - The Perceived Consequences

associated with family satisfaction had to be interpreted in light of the original direction of the relationships. These relationships are shown by Pearson Correlation Coefficients which are provided next to any relevant results pertaining to family satisfaction.

MANOVA and ANOVA were used for questions four and six which dealt with the impact of parental status and gender on the relationships between frequency of cellular telephone use and the perceived consequences. In other words, did cellular users with children experience different levels of, for example, perceived stress, than users without children? Since the goals of questions four and six were to examine parental status and gender as moderating variables, analysis of the 3X2 MANOVAs and 3X2 ANOVAs involved interpreting only the interactions between [Frequency of Use by Parental Status] and [Frequency of Use by Gender] and not the main effects of either frequency of use, parental status or gender. By only considering the interaction effect, it was possible to isolate the influence of parental status and gender on the relationship between frequency of use and the perceived consequences.

Where significant interactions were discovered, univariate F tests were used to determine which perceived consequences were significant. The group means for those consequences were then graphed in order to visually examine the effect.

Unfortunately, there were not enough male non-parents in the heavy frequency of use category ($N = 12$) to allow calculation of a [Gender by Parental Status by Frequency of Use] MANOVA. Questions four and six had to be analyzed separately using two 3X2 MANOVAs and two 3X2 ANOVAs: [Frequency of Use by Parental Status] and [Frequency of Use by Gender].

MANCOVA and ANCOVA were employed for questions eight and ten which explored whether work and family demands acted as moderating variables in the relationships between frequency of cellular telephone use and the perceived consequences (i.e. do users with heavy work and family demands have the same levels of, for example, time management, as users with light work and family demands?). (For an explanation of MANCOVA, please refer to the discussion concerning questions seven and nine). Once again, family satisfaction was analyzed on its own. Question eight was analyzed using a 3X2 MANCOVA and a 3X2 ANCOVA with covariates as follows: [Frequency of Use by Gender] with {Total Work Hours and Work Involvement}. Similarly, question ten was analyzed using a 3X2 MANCOVA and a 3X2 ANCOVA with covariates as follows: [Frequency of Use by Gender] with {Total Family Hours and Family Involvement}.

As with questions four and six, the important effects for questions eight and ten were the interactions between work demands and frequency of use and

family demands and frequency of use. It was this effect that demonstrated whether or not work and family demands were influencing the relationship between frequency of cellular telephone use and the perceived consequences. This effect was examined using the test for the homogeneity of the regression hyperplanes which tested the interaction between the covariates (work and family demands) and the grouping variables (frequency of use and gender). When there was multivariate significance (Hotelling's T^2 was significant at $\alpha = .05$), the individual perceived consequences were examined for significant univariate F tests. Graphs are provided for those situations where the covariates had a significant interaction with frequency of use.

The results for questions eight and ten were presented in the same manner as they were for questions four and six. Unfortunately, SPSSx (Statistical Package for the Social Sciences which was the software employed for the entire data analysis) did not provide group means for covariates since they were measured on a continuous scale. In order to get the information needed to determine if the interaction effect was spurious or not, separate simple regression lines had to be calculated for each of the covariates on each of the frequency of use groups.

For example, an interaction between work demands (comprised of total work hours and work involvement) and frequency of use on the perceived consequence of work satisfaction required the calculation of six simple regression equations (three equations for work satisfaction predicted by total work hours for light, medium and heavy users, and three equations for work satisfaction predicted by work involvement for light, medium and heavy users).

The eight hypotheses which dealt with the direction of the relationship between the perceived consequences and frequency of cellular telephone use were analyzed using a 3X2 MANCOVA and a 3X2 ANCOVA [Frequency of Use by Gender] with {Total Work Hours, Work Involvement, Total Family Hours and Family Involvement} as covariates. The adjusted group means were plotted for men and women if there were significant group differences for frequency of use. This was done to illustrate the direction of the relationship.

TABLE DA-1: SUMMARY OF DATA ANALYSIS TECHNIQUES

<u>QUESTIONS/HYPOTHESES</u>	<u>MULTIVARIATE TESTS</u>	<u>MULTIVARIATE AND UNIVARIATE FOLLOW-UP TESTS</u>
Characteristics of the sample	-----	Frequencies and Chi-square
1) Motivations related to cellular telephone use	-----	Frequencies and T Tests
2) Motivations related to frequency of use	3X2 MANOVA/3X2 ANOVA: Motivations by [Frequency of Use by Gender]	F tests and Discriminant Analysis
3) Motivations related to parental status	3X2 MANOVA/3X2 ANOVA: Motivations by [Parental Status by Gender]	F tests and Discriminant Analysis
5) Motivations related to gender	The 3X2 MANOVAs/3X2 ANOVAs from questions 2 and 3	F tests and Discriminant Analysis
4) Parental Status as a moderator between frequency of use and perceived consequences	3X2 MANOVA/3X2 ANOVA: Perceived Consequences by [Frequency of Use by Parental Status]	Graph of group means
6) Gender as a moderator between frequency of use and perceived consequences	3X2 MANOVA/3X2 ANOVA: Perceived Consequences by [Frequency of Use by Gender]	Graph of group means

TABLE DA-1: SUMMARY OF DATA ANALYSIS TECHNIQUES (Continued)

<u>QUESTIONS/HYPOTHESES</u>	<u>MULTIVARIATE TESTS</u>	<u>MULTIVARIATE AND UNIVARIATE FOLLOW-UP TESTS</u>
7) Motivations related to work demands	MANCOVA/ANCOVA: Motivations by [Gender] with {Work Demands}	Canonical Correlation and Multiple Regression
9) Motivations related to family demands	MANCOVA/ANCOVA: Motivations by [Gender] with {Family Demands}	Canonical Correlation and Multiple Regression
8) Work demands as a moderator between frequency of use and perceived consequences	3X2 MANCOVA/3X2 ANCOVA: Perceived Consequences by [Frequency of Use by Gender] with {Work Demands}	Graphs of Simple Regression Equations
10) Family demands as a moderator between frequency of use and perceived consequences	3X2 MANCOVA/3X2 ANCOVA: Perceived Consequences by [Frequency of Use by Gender] with {Family Demands}	Graphs of Simple Regression Equations
Hypotheses	3X2 MANCOVA/3X2 ANCOVA: Perceived Consequences by [Frequency of Use by Gender] with {Work and Family Demands}	Graphs of Adjusted Means

Results and Discussion

The first part of this section looks at the demographic characteristics of the sample, the second part reports the results of research questions one through ten and the third part presents the results of the hypotheses. The tables for each question are presented after the discussions in order for the text to flow smoothly.

Characteristics of the Respondents

The following characteristics of the sample were examined in this analysis: gender, country region, age, frequency of cellular telephone use, marital status, parental status, responsibility for child care, income, education, occupation, company ownership, professional status and company size. In addition, the following cellular characteristics were examined: use of cellular telephone for work, use of phone during daily commute, proportion of business and personal calls, proportion of calls made and received, number of calls made and received per week, change in average daily output at work, change in number of hours worked per week and change in stress level. Tables D-1 and D-2 provide a summary of the results discussed in this section as well as chi-square and t test statistics for statistical significance between men and women.

Gender: Two hundred and ninety-one (55.4%) questionnaires were returned by men and two hundred and thirty (43.8%) were returned by women. Four of the respondents did not answer the gender question.

Country Region: Most of the respondents were from Ontario (45.5). This finding was not unexpected as this area of the country comprises almost half of

Cantel's subscriber population (Commins, Wingrove, 1990). Men and women were equally represented in Ontario and English Quebec. Significantly more men than women respondents were from the Atlantic and Quebec French regions. Respondents from the West were significantly more likely to be women. This finding was not surprising given the sampling frame.

Age: Most of the respondents were between the ages of 25 to 44. There was a slightly higher percentage of men in the 55-64 age category. The 25-34 age category, on the other hand, had a higher percentage of women. Overall the percentages of men and women in all the age brackets were fairly similar. Statistically speaking, men and women were considered to be identical on this variable.

Frequency of Use: A majority of the respondents were from the light use category. This meant that they used less than one hundred cellular minutes of airtime per month. The next highest category was the medium users, followed by the heavy and very heavy users. The lack of very heavy respondents may be an indication that they are too busy to answer the survey. There was almost an equal percentage of men and women in each category. This gender equality was statistically confirmed by a non-significant chi-square test result.

Marital Status: Seventy-five percent of the respondents indicated that they were either married or living with a significant other. More men were married while more women were either divorced, widowed or had never been married at all. A chi-square test confirmed that these differences were significant. These findings correspond to national data and may be attributed to two facts: (1)

working women are significantly more likely to postpone marriage, and (2) divorced men are significantly more likely to remarry.

Parental Status: An overwhelming number of the respondents (68.8%) indicated that they were parents. A higher percentage of men (77.3%) than women (58.1%) had children. According to the chi-square test, significantly more men were parents. These findings also correspond to national data. Women who are highly involved with their work are significantly more likely to postpone having children or remain childless.

Responsibility for Child Care: While half of the respondents indicated that their spouse had the main responsibility for arranging for child care, there were large gender differences for this variable. Sixty-six percent of the women indicated that they had responsibility for arranging for their children's daily care and seventy percent of the men left this responsibility up to their spouses. These results were statistically significant and consistent with socio-cultural norms which dictate that women assume primary responsibility for child care.

Income: Most of the respondents were in the \$25,000 to \$64,000 income bracket; men and women had approximately the same incomes. The only notable gender differences were that a slightly higher percentage of men were in income brackets over \$100,000 while the reverse was true for the income bracket below \$25,000. According to the chi-square test, these differences were not statistically significant.

Education: Overall, the sample appeared to be fairly well educated, with 41% having either undergraduate or graduate university degrees. A higher

percentage of men had technical/trade educations while women were higher on college/CEGEP and undergraduate degrees. The chi-square test confirmed that the female respondents had received significantly more formal education.

Occupation and Company Ownership: Most of the sample (53.3% of the men and 27.4% of the women) listed themselves as either owners, presidents or partners of their companies. The second most popular occupation was sales with women outranking the men almost 3:1. Being a manager accounted for the third highest percentage of respondents. The chi-square tests showed that there were significant differences between men and women concerning their occupations. Men were significantly more likely to be company owners.

Professional Status: A majority of both male and female respondents listed themselves as not holding any professional certification. Statistically speaking, there did not appear to be a significant gender difference on this variable.

Company Size: Most of the respondents worked in companies that employed between two to fifty people. Significantly more men than women worked in small (i.e. two to nine people) companies and more women worked in companies that had staffs of between ten to two hundred and fifty.

Use of Cellular Telephone for Work-Related Purposes: Ninety-three percent of the respondents indicated that they use their cellular telephones for work. Based on the chi-square test, men appeared to use their phones for work significantly more often than women.

Use of Cellular Telephone during Daily Commute: Eighty-nine percent of the respondents used their cellular telephones during their daily commutes to

work. Statistically speaking, there was no significant difference between men and women on this variable.

Business and Personal Calls: The respondents used their phones for business about 70% of the time with personal calls accounting for the remaining 30%. The t tests show that men made significantly more business calls and women made significantly more personal calls.

Calls Made and Received: Making calls accounted for about 75% of cellular activity. Women made significantly more calls and men received significantly more calls. On average, men made and received about 31 calls per week and women made and received about 23 calls per week. Statistically speaking, men showed significantly more cellular activity than women.

Change in Average Output at Work: Overall, the respondents indicated that having and using a cellular telephone had only helped them increase their daily average work output by a small amount. Men and women were almost identical on this variable.

Change in Number of Hours Worked Per Week: Overall, the respondents perceived that using a cellular telephone for work resulted in a small increase in the number of hours they worked per week. There was a significant gender difference with the men perceiving that they had a larger increase in working hours.

Change in Stress Level: The respondents indicated that their stress levels had decreased by a small amount as a result of using a cellular telephone for work. There was a significant gender difference with women perceiving that

their stress levels were lower.

Summary of Demographic Characteristics

Overall, the majority of male and female respondents were:

- between the ages of twenty-five and forty-four;
- from Ontario;
- light users of cellular air time;
- married with children;
- not responsible for arranging their children's daycare if they were men and very much responsible if they were women;
- earning between \$25,000 and \$64,000;
- well-educated with at least one university degree;
- company owners/presidents or partners if they are men and salespeople if they were women;
- not professionally certified; and
- working in small to medium-sized companies.

Most cellular activity consisted of outgoing calls which concerned work-related matters. Overall, the respondents did not feel that having and using a cellular telephone had helped them to either increase their average daily work output by a great deal, decrease the number of hours they work per week by a large amount or alleviate the stress of their jobs by an overwhelming amount.

Women cellular phone users were significantly more likely than male users to be childless, single or divorced, responsible for child care and be highly

educated. They were also significantly more likely to use their phone for personal calls, make (rather than receive) cellular calls and significantly less likely to make or receive as many calls.

Table D-1 - DEMOGRAPHICS

				MEN VS. WOMEN		
	MEN %	WOMEN %	TOTAL %	χ^2	D.F.	α
GENDER	N=291 55.4	N=230 43.8	N=521 100.0	-----	-	---
COUNTRY REGION	N=285	N=229	N=514	24.56	4	.000*
Atlantic	14.0	6.6	10.7			
Quebec French	20.0	9.6	15.4			
Quebec English	5.3	5.7	5.4			
Ontario	43.2	48.4	45.5			
West	17.5	29.7	23.0			
AGE	N=284	N=226	N=510	10.65	5	.059
18-24	3.5	3.5	3.5			
25-34	28.5	35.8	31.8			
35-44	41.9	37.6	40.0			
45-54	20.1	20.4	20.2			
55-64	6.0	1.8	4.1			
Over 65	0	.9	.4			
FREQUENCY OF USE	N=285	N=229	N=514	1.00	3	.802
Light	51.6	47.6	49.8			
Medium	27.4	28.4	27.8			
Heavy	13.0	15.3	14.0			
Very Heavy	8.1	8.7	8.4			
MARITAL STATUS	N=290	N=230	N=520	16.04	4	.003*
Married/Sig. Oth.	80.7	67.8	75.5			
Divorced	4.1	9.1	6.3			
Widowed	.3	2.6	1.3			
Separated	4.5	4.3	4.4			
Never Married	10.3	16.1	12.9			
PARENTAL STATUS	N=291	N=229	N=520	22.12	1	.000*
Yes	77.3	58.1	68.8			
No	22.7	41.9	31.2			

Table D-1 - DEMOGRAPHICS (Continued)

				MEN VS. WOMEN		
	MEN %	WOMEN %	TOTAL %	χ^2	D.F.	α
RESPONSIBILITY FOR CHILD CARE	N=200	N=98	N=298	165.72	4	.000*
Respondent Has	3.0	66.3	23.8			
Share with	27.0	27.6	27.2			
Spouse Spouse Has	70.0	6.1	49.0			
INCOME	N=283	N=220	N=503	13.12	7	.069
Under \$25K	8.5	11.8	9.9			
\$25-34K	14.8	19.5	16.9			
\$35-49K	23.3	26.4	24.7			
\$50-64K	20.1	18.2	19.3			
\$65-79K	7.4	8.6	8.0			
\$80-99K	8.1	6.8	7.6			
\$100-149K	8.8	5.9	7.6			
\$150K and over	8.8	2.7	6.2			
EDUCATION	N=287	N=226	N=513	22.54	5	.000*
Public	1.7	1.3	1.6			
High	26.5	22.1	24.6			
Technical/Trade	18.1	6.2	12.9			
College/CEGEP	16.3	23.5	19.5			
University						
- Undergraduate	17.8	26.1	21.4			
- Graduate	19.5	20.8	20.1			
OCCUPATION	N=289	N=230	N=519	70.02	10	.000*
Owner/President/ Partner	53.3	27.4	41.8			
Vice President	4.2	3.0	3.7			
Manager	12.1	13.0	12.5			
Administration	1.7	7.4	4.2			
Sales	13.5	36.1	23.5			
Service	3.5	1.3	2.5			
Technical	3.5	.9	2.3			
Clerical	.3	1.3	.8			
Homemaker	0	1.3	.6			
Other	6.9	7.4	7.1			
Retired	1.0	.9	1.0			

Table D-1 - DEMOGRAPHICS (Continued)

	MEN %	WOMEN %	TOTAL %	MEN VS. WOMEN		
				χ^2	D.F.	α
COMPANY OWNER?	N=291	N=228	N=519	30.00	1	.000*
Yes	58.8	34.2	48.0			
No	41.2	65.8	52.0			
PROFESSIONAL STATUS?	N=289	N=228	N=517	3.32	1	.068
Yes	23.2	30.7	26.5			
No	76.8	69.3	73.5			
COMPANY SIZE	N=283	N=223	N=506	17.14	5	.004*
1 person only	7.8	9.0	8.3			
2 - 9	41.3	26.0	34.6			
10-49	20.1	26.0	22.7			
50-249	12.4	18.8	15.2			
250-999	8.9	6.3	7.7			
1,000 or more	9.5	13.9	11.5			
USE OF PHONE FOR WORK	N=291	N=228	N=519	8.12	1	.004*
Yes	95.9	89.5	93.1			
No	4.1	10.5	6.9			
USE OF PHONE DURING COMMUTE	N=289	N=226	N=515	.52	2	.772
Yes	90.0	88.5	89.3			
No	4.5	4.4	4.5			
Work out of home	5.5	7.1	6.2			

Table D-2 - Demographic t Tests

	MEN		WOMEN		MEN VS. WOMEN		
	Mean	S.D.	Mean	S.D.	T test	D.F.	α
% BUSINESS CALLS	74.7	26.2	67.3	32.1	-2.89	515	.004*
% PERSONAL CALLS	25.3	26.2	32.7	32.1	2.88	515	.004*
% CALLS MADE	70.1	23.6	78.4	20.7	-4.17	513	.000*
% CALLS RECEIVED	29.9	23.6	21.7	20.6	4.15	513	.000*
NUMBER OF CALLS MADE & RECEIVED	30.56	38.43	23.25	23.84	2.60	431	.010*
<u>CHANGES IN:</u>							
Average output at work	3.76	.749	3.72	.791	.62	463	.533
Number of hours worked per week	3.31	.721	3.15	.755	2.19	454	.029*
Stress level	2.82	.910	2.50	.988	3.64	463	.000*

Question #1: Cellular Users' Motivations

Results

Question one seeks to determine what motivates people to use a cellular telephone. Separate frequencies were tabulated for each of the fourteen motivation questions (reproduced in Figure 4) for male and female respondents. The mens' results are in Table 1-1 and the womens' results are detailed in Table 1-2. The gender comparison T test results are provided in Table 1-3.

Even though men and women agreed on the importance of almost all the same motivations, there were large differences in the degrees to which they agreed. It was felt that ranking the motivations would simplify the discussion and make it easier to understand how much importance each gender placed on each of the motivations. As noted previously, a ranking of one means that 75% or more of the respondents agreed with that motivation for using a cellular telephone. A ranking of two classifies a level of agreement between 50% to 75%, three indicates between 25% to 50% agreed with the motivation and four means that less than 25% of the respondents were in agreement.

The results for each motivation are presented below. Recall that high scores on the question indicate that the respondent agrees that this factor motivates them to use their cellular telephone.

M1 - More Job Control: Overall, the respondents agreed that this was an important motivation for using a cellular telephone. There was a statistically significant gender difference in the tendency to use a cellular phone to increase job control. Due to the normalizing transformation performed on M1, the scale

of the variable was reversed (i.e. high scores meant it was less likely that job control was an important motivation). It appears then, that women are significantly more likely than men to see increased job control as a reason for adopting a cellular telephone since they have a ranking of one versus the men's ranking of two.

M2 - Faster Turnaround: Both men and women strongly agreed with this motivation. The t test did not indicate a significant difference between the genders. Both men and women used a cellular telephone because they perceived that it gave them faster turnaround time on their work (both were ranked one).

M3 - Encouraged by Boss/Colleagues: There was much less agreement concerning the importance of this reason for using a cellular telephone (i.e. 45% agree) than was found with other variables (men and women both ranked it a three). The t test did not indicate a significant gender difference.

M4 - Encouraged by Spouse: Men disagreed with this motivation and women were neutral. Neither group ranked this as an important reason for adopting a cellular phone (i.e. both ranked fourth). This difference was not statistically different.

M5 - Balance Work and Home: While both men and women agreed with this motivation for using a cellular telephone, men ranked it third and women ranked it second. This gender difference was confirmed by the t test which indicated that women agreed significantly more than men that this was an important reason for using a cellular phone.

M6 - Safety and Security: Men and women were ranked one on this motivation which meant that they considered it to be a very important reason for using a cellular telephone. Due to the normalizing transformation performed on M6, the scale was reversed (i.e. high scores indicated lower levels of agreement with the motivation). The t test result has to be interpreted with this in mind. There was a statistical difference between the genders. Women were significantly more likely than men to agree that concerns for safety and security motivated them to adopt a cellular phone.

M7 - Stay in Touch With Clients: Both men and women agreed with this motivation (ranked one for both genders). While the t test showed that women were significantly more likely to agree with this motivation than men, the mean difference was very small.

M8 - People Can Reach Me: Both genders agreed with this motivation (ranked one for both genders). There was no statistical difference in the tendency to adopt cellular phones to make one's self more accessible to others.

M9 - Rearrange Schedule: This motivation was important to both men and women (ranked one for both genders). Statistically speaking, it was a more important reason for using a cellular phone for women than men.

M10 - Remain Competitive: Men and women both agreed with this motivation for using a cellular telephone (both were ranked one). According to the t test, women placed a higher value on this motivation for using a cellular telephone.

M11 - Schedule Free Time: Both men (ranked two) and women (ranked one) agreed with this motivation. There was a significant difference, however, as women agreed more often than men that they use a cellular telephone to schedule their free time.

M12 - Manage Family Life: Significantly more women (65% of the female sample) than men (45% of the male sample) agreed that they use a cellular telephone to manage their family demands (women ranked this motivation as a two versus a three for men). According to the t test, this difference was statistically significant.

M13 - Contact Caregiver: Men tended to be neutral concerning this motivation for using a cellular telephone (with a rank of three). Women, on the other hand, agreed that they use a cellular phone to contact their child's caregiver (with a rank of two). The t test showed that women were significantly more likely than men to place importance on this motivation.

M14 - Enhance Status: Both men and women were neutral concerning this reason for using a cellular telephone (ranked three by both genders). Statistically, there was no difference between them.

Discussion

The results of this research appeared to confirm what little information was already known about cellular users' motivations. Similar to the AT&T (Zey, 1988) and Nynex (Yankelovich et al, 1990) studies, both men and women respondents to this survey agreed that they use a cellular telephone because:

- it gives them faster turnaround time on their work (men: 83.3%, women: 85.5%);
- they can rearrange their work schedules easily and quickly (men: 89.8%, women: 95.4%);
- it helps them remain competitive within their respective industries (men: 65.6%, women: 74.2%);
- it allows them to stay in touch with their clients (men and women: 91%);
- they can be reached wherever they are (men: 91.2%, women: 87.3%).

The results also concurred with the Motorola (Gallup, 1991) report which found that most of the respondents (men = 78%, women = 87%) felt safer and more secure when they travelled with a cellular telephone. The current study had approximately the same proportion of male (75.7%) and female (89.8%) respondents agreeing with this motivation. It was interesting to note that a significantly higher percentage of women view safety and security as important reasons for having a cellular telephone. This finding is not surprising given the fact that we live in a society where women are in greater need of protection.

The most important reasons (ranked one) that both genders listed for using a using cellular telephones was to increase their work time and location flexibility and increase their control over unexpected occurrences in the work domain (i.e. M1-More Job Control, M2-Faster Turnaround Time, M7-Stay in Touch with Clients, M8-People Can Reach Me, and M9-Rearrange Schedule). Women were

especially likely to appreciate the increase in job control offered by this technology (i.e. women were significantly more likely than men to agree with M1-More Job Control and M9-Rearrange Schedule).

A major premise of this research is that cellular telephones may provide users with the work-arrangement flexibility they need to manage the conflicting demands of work and family. A preliminary examination of the results seems to show that the respondents agree with this premise. There was agreement on the motivations of balancing work and home (M5), ability to be reached at all times (M8), scheduling free time (M11) and managing family life (M12). This, coupled with the fact that most of the respondents were married with children, seemed to indicate that they were actively engaged in using their cellular telephones to aid them in balancing work and family demands.

Both men and women indicated that they were not motivated by the wishes of others (M3-Encouraged by Boss was ranked third and M4-Encouraged by Spouse was ranked fourth for both genders) or other's perceptions of them (M14-Status Enhancement was ranked third) to use a cellular telephone. Instead, motivations for using a cellular telephone appeared to be internally generated (i.e. desire to succeed at work and home).

The results indicated that women were significantly more likely to adopt cellular phones because it helped them balance work and family demands. This finding is not surprising given that the simultaneous nature of women's work and family demands frequently means that they need the greater work time and location flexibility and control offered by this work arrangement to manage

unexpected occurrences in both the work and family domains than do men with sequential demands.

It was interesting to note that for the motivations specifically related to family (M5 and M12), the statistics showed women agreeing significantly more than men as to their importance in adopting a cellular telephone. For the motivation of contacting a caregiver, women far outweighed the men at 64% to 34% agreement. These findings would seem to serve as further confirmation for Googins & Burden (1987), Hertz (1986) and all the other authors who have shown that women are usually more responsible than men for household management and child care. It would appear that women do view their cellular telephones as a method for coping with these responsibilities.

This finding is consistent with the fact that many working mothers have a greater need for work flexibility (Bohen & Viveros-Long, 1981) due to socio-cultural expectations that women will take primary responsibility for the family domain despite their work status. Women are considered to have simultaneous work and family demands (Hall & Richter, 1988) while men have sequential demands. This means that women are expected to take care of their responsibilities related to work and family simultaneously, i.e. family problems often intrude during the work day and women are expected to resolve them without interrupting the flow of their work schedule. On the other hand, men are usually allowed to deal with their work and family demands at separately fixed intervals and the two domains do not tend to interfere with each other. For example, when a man leaves for work in the morning, his mind is focused on work and he leaves his

family responsibilities behind. These family duties and obligations are usually not encountered again until he is on his way home at the end of the work day. Women seem more likely than men to need the flexibility offered by cellular telephones to manage their simultaneous work and family demands.

Table 1-1 - Mens' Motivations for Using a Cellular Telephone

MOTIVATION	AGREE %	NEUTRAL %	DISAGREE %	CONCLUSION	RANKING
M1-MORE JOB CONTROL	68.0	22.1	9.8	AGREE	2
M2-FASTER TURNAROUND	83.3	14.0	2.7	AGREE	1
M3-ENCOURAGED BY BOSS/COLLEAGUES	45.0	33.2	21.8	AGREE	3
M4-ENCOURAGED BY SPOUSE	18.2	37.5	44.3	DISAGREE	4
M5-BALANCE WORK AND HOME	47.5	29.9	22.6	AGREE	3
M6-SAFETY & SECURITY	75.7	15.7	8.6	AGREE	1
M7-STAY IN TOUCH WITH CLIENTS	91.0	6.3	2.7	AGREE	1
M8-PEOPLE CAN REACH ME	91.2	4.9	3.9	AGREE	1
M9-REARRANGE SCHEDULE	89.8	6.8	3.4	AGREE	1
M10-REMAIN COMPETITIVE	65.6	24.7	9.7	AGREE	2
M11-SCHEDULE FREE TIME	46.2	32.2	21.6	AGREE	3
M12-MANAGE FAMILY LIFE	42.2	35.0	22.9	AGREE	3
M13-CONTACT CAREGIVER	34.4	39.4	26.2	NEUTRAL	3
M14-ENHANCE STATUS	28.3	43.0	28.7	NEUTRAL	3

Table 1-2 - Womens' Motivations for Using a Cellular Telephone

MOTIVATION	AGREE %	NEUTRAL %	DISAGREE %	CONCLUSION	RANKING
M1-MORE JOB CONTROL	77.5	14.4	8.0	AGREE	1
M2-FASTER TURNAROUND	85.5	10.4	4.1	AGREE	1
M3-ENCOURAGED BY BOSS/COLLEAGUES	43.9	34.8	21.3	AGREE	3
M4-ENCOURAGED BY SPOUSE	16.9	46.0	37.1	NEUTRAL	4
M5-BALANCE WORK AND HOME	61.4	25.6	13.1	AGREE	2
M6-SAFETY & SECURITY	89.8	7.1	3.1	AGREE	1
M7-STAY IN TOUCH WITH CLIENTS	91.0	5.9	3.2	AGREE	1
M8-PEOPLE CAN REACH ME	87.3	6.4	6.4	AGREE	1
M9-REARRANGE SCHEDULE	95.4	2.5	2.0	AGREE	1
M10-REMAIN COMPETITIVE	74.2	21.5	4.3	AGREE	2
M11-SCHEDULE FREE TIME	67.0	24.1	8.9	AGREE	2
M12-MANAGE FAMILY LIFE	65.0	26.1	8.9	AGREE	2
M13-CONTACT CAREGIVER	64.4	21.8	13.9	AGREE	2
M14-ENHANCE STATUS	33.5	43.4	23.1	NEUTRAL	3

Table 1-3- Gender Comparison of Motivations for Using a Cellular Telephone

MOTIVATION	MEN		WOMEN		MEN VS. WOMEN		
	Mean	S.D.	Mean	S.D.	T test	D.F.	α
+M1-MORE JOB CONTROL	1.43	.354	1.35	.355	2.24	429	.025*
+M2-FASTER TURNAROUND	.712	.288	.726	.287	-.51	414	.612
M3-ENCOURAGED BY BOSS/COLLEAGUES	3.31	1.23	3.23	1.26	.56	355	.575
M4-ENCOURAGED BY SPOUSE	2.52	1.17	2.56	1.26	-.33	298	.738
M5-BALANCE WORK AND HOME	3.23	1.15	3.65	1.14	-3.64	395	.000*
+M6-SAFETY & SECURITY	1.37	.354	1.18	.291	6.50	490	.000*
+M7-STAY IN TOUCH WITH CLIENTS	.778	.274	.830	.265	-1.99	441	.047*
+M8-PEOPLE CAN REACH ME	.782	.275	.806	.284	-.94	502	.347
+M9-REARRANGE SCHEDULE	.747	.279	.824	.255	-2.98	460	.003*
M10-REMAIN COMPETITIVE	3.80	1.09	4.12	.992	-2.98	388	.003*
M11-SCHEDULE FREE TIME	3.30	1.23	3.79	1.07	-4.28	425	.000*
M12-MANAGE FAMILY LIFE	3.16	1.14	3.78	1.08	-5.55	401	.000*
M13-CONTACT CAREGIVER	3.01	1.26	3.75	1.28	-4.63	259	.000*
M14-ENHANCE STATUS	2.84	1.16	3.01	1.20	-1.43	417	.153

Key: S.D. = Standard Deviation

* = Regular Data Transformation

+ = Scale Reversing Data Transformation

Question #2: Motivations Related to Frequency of Use

Two 3X2 MANOVAs (for the grouped variables) and two 3X2 ANOVAs (for the ungrouped variables), [Frequency of Use by Gender] and [Parental Status by Gender] were performed to answer research questions two (motivations related to frequency of use), three (motivations related to parental status) and five (motivations related to gender). The results and discussions for each of the questions are presented in separate sections below.

Results

Question two examines whether motivations are related to frequency of cellular telephone use. The data analysis done in conjunction with question two is presented in tables 2-1 through 2-7. Table 2-1 presents the means and standard deviations for the frequency of use by gender breakdowns for each of the fourteen motivations. It should be noted that for M1-More Job Control and M6-Safety and Security, low scores mean greater agreement with the motivations due to the data transformations. Multivariate results for the grouped motivations (i.e. job, family and personal) are given in Table 2-2. Table 2-3 presents the univariate results for the non-grouped motivations for question two.

Data in Table 2-2 shows multivariate significance for the main effect frequency of use for job ($\alpha = .008$) and personal ($\alpha = .008$) motivations. Table 2-3 shows univariate significance for the main effect frequency of use for M3-Encouragement by Boss ($\alpha = .000$).

No significant multivariate differences were found between frequency of use and family motivations ($\alpha = .92$) or the three non-grouped motivations of M4-

Encouragement by Spouse ($\alpha = .26$), M13-Contact Caregiver ($\alpha = .92$) and M14-Status Enhancement ($\alpha = .94$). No significant interactions between gender and frequency of use were observed for any of the motivations included in this analysis.

Follow-up univariate comparisons and Discriminant Analyses were done for all relationships which showed multivariate significance and the results are described below.

Follow-up analysis: job-related motivations.

Table 2-4 provides the results of the univariate follow-up F test for each of the job-related motivations. Significant differences were found between the frequency of use groups for the motivations of more job control (M1), faster turnaround time (M2), staying in touch with clients (M7) and remaining competitive (M10). The motivation for rearranging a work schedule (M9) was not found to be significant. The means in Table 2-1 indicated that frequency of use was positively associated with a desire for greater job control and faster turnaround time, the need to stay in touch with clients and rearrange work schedules. The same association was evident between female respondents and remaining competitive. On the other hand, men in the medium frequency of use category seemed to place more emphasis on remaining competitive than did men in the light or heavy categories.

Table 2-5 provides the results of the follow-up Discriminant Analysis for job-related motivations. When interpreting this data it must be recalled that M1 was transformed. Therefore, the interpretation of the data was in the opposite

direction of the correlation given in Table 2-5.

According to the Discriminant Ratio Coefficients, all the motivations which had univariate significance were responsible for multivariate discrimination between user groups. In order of increasing importance, they were: staying in touch with clients (M7), faster turnaround time (M2) and more job control (M1). In other words, these motivations were able to discriminate between the three frequency of use groups. Since all of these variables were positively correlated with the discriminant function (including M1 when it is not transformed), the group with the largest mean had the highest scores on the variables.

Figure 6 is a plot of the group centroids for the job-related motivations. This figure indicates that heavy users agreed with M1, M2 and M7 as important reasons for using a cellular telephone. They were less important for medium users and the least important for light users.

Follow-up analysis: personal motivations.

Table 2-6 provides the univariate follow-up results for the personal motivations. For the personal motivation group, there seemed to be differences between the frequency of use groups for the motivation of being reached at all times (M8).

Discriminant Analysis results are presented in Table 2-7. According to the Discriminant Analysis, M8 appeared to be responsible for the differences between the three frequency of use groups. A group centroid plot is provided in Figure 7. It indicates a curvilinear pattern. It appears that this motivation increases in importance from light to medium users but decreases slightly from medium to heavy users.

Follow-up analysis: non-grouped motivations.

Only one of the non-grouped motivations, M3-Encouraged by Boss, demonstrated univariate significance for the frequency of use main effect (see Table 2-3). A group centroid plot (see Figure 8) showed that heavy users placed a much greater emphasis on this motivation than did medium and light users.

Discussion

Heavy users of cellular telephones were significantly more likely than light users to use this technology because they perceived that it increased the amount of control they had over uncertainties in their work domain (i.e. M1-More Job Control, M7-Stay in Touch with Clients, M8-Can be Reached at All Times) and increased their chance of success in the work domain (i.e. M10-Greater Competitive Advantage, M2-Faster Turnaround Time). Since these users do have heavier workloads (see Appendix 7), this data suggests that making extensive use of a cellular phone is positively associated with higher work ambitions and a greater need for control over uncertainties in the work domain. It is uncertain from this data, however, whether heavy users use the technology to increase their control over their work domain, or alternatively, individuals with a greater amount of uncertainty in their work domain (e.g. clients are hard to reach) have a greater need to make use of cellular phones. In any case, respondents who make heavier use of cellular phones appear to be attracted to this technology by the greater amount of work time and location flexibility they perceive it offers.

Heavier users were also more likely to have been encouraged by their superiors and/or colleagues to adopt the technology. This may be a reflection

that, given their heavy workloads, they are encouraged by others to adopt methods which will help them to better manage their duties and thereby ease the potential for stress and burn-out.

It was interesting to note that, other than the ability to be reached at all times, family and personal factors were not able to differentiate heavy and light users. This may be an indication that the cellular telephone is still perceived primarily as a work tool, and any benefits relating to family or personal circumstances are considered to be secondary reasons for using it.

**Table 2-1 - Means and Standard Deviations:
MOTIVATIONS by [Frequency of Use by Gender]**

JOB	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
M1-MORE JOB CONTROL	1.50	.361	1.36	.331	1.36	.322	1.34	.344	1.37	.357	1.27	.341
M2-FASTER TURNAROUND	.656	.294	.659	.304	.707	.285	.711	.271	.802	.263	.786	.275
M7-STAY IN TOUCH WITH CLIENTS	.723	.278	.766	.295	.826	.266	.816	.278	.880	.222	.895	.206
M9-REARRANGE SCHEDULE	.751	.281	.788	.277	.760	.285	.810	.261	.772	.278	.895	.206
M10-REMAIN COMPETITIVE	3.54	1.13	4.09	1.04	4.14	.888	4.02	1.01	3.98	1.08	4.28	.959
FAMILY												
M5-BALANCE WORK AND HOME	3.23	1.15	3.64	1.09	3.32	1.18	3.66	1.14	3.24	1.10	3.72	1.36
M12-MANAGE FAMILY LIFE	3.12	1.20	3.69	1.07	3.15	.960	3.82	1.08	3.16	.973	3.54	1.17

Key: S.D. = Standard Deviation # = Regular Data Transformation + = Scale Reversing Data Transformation

Table 2-1 - Means and Standard Deviations:
MOTIVATIONS by [Frequency of Use by Gender] (Continued)

	LIGHT USERS			MEDIUM USERS			HEAVY USERS		
	MEN		WOMEN		MEN		WOMEN		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	S.D.
PERSONAL									
M6-SAFETY & SECURITY	1.35	.359	1.15	.285	1.38	.358	1.18	.294	1.24 .292
M8-PEOPLE CAN REACH ME	.753	.282	.756	.302	.847	.248	.840	.277	.873 .252
M11-SCHEDULE FREE TIME	3.44	1.25	3.82	1.08	3.29	1.18	3.84	1.03	3.72 1.10
NON-GROUPED									
M3-ENCOURAGED BY BOSS/COLLEAGUES	3.17	1.26	2.91	1.23	3.30	1.13	3.22	1.22	3.69 1.18 3.85 1.14
M4-ENCOURAGED BY SPOUSE	2.44	1.25	2.87	1.27	2.64	1.14	2.51	1.21	2.17 1.23
M13-CONTACT CAREGIVER	3.04	1.28	3.73	1.16	3.21	1.34	3.68	1.44	2.82 1.12 3.88 1.33
M14-ENHANCE STATUS	2.84	1.19	3.04	1.15	2.94	1.04	2.87	1.27	2.76 1.21 3.15 1.18

Key: S.D. = Standard Deviation # = Regular Data Transformation + = Scale Reversing Data Transformation

Table 2-2 - MANOVA Results:
GROUPED MOTIVATIONS by
[Frequency of Use by Gender]

MOTIVATIONS	Hotelling's T^2	Approx. F	D.F.	α
JOB-RELATED				
Main Effects:				
Frequency of Use (L/M/H)	.071	2.43	10,688	.008*
Gender (M/W)	.034	2.32	5,345	.043*
Interaction	.034	1.15	10,688	.319
FAMILY-RELATED				
Main Effects:				
Frequency of Use (L/M/H)	.003	0.24	4,676	.916
Gender (M/W)	.058	9.80	2,339	.000*
Interaction	.005	0.42	4,676	.796
PERSONAL				
Main Effects:				
Frequency of Use (L/M/H)	.044	2.91	6,798	.008*
Gender (M/W)	.100	13.36	3,400	.000*
Interaction	.005	0.37	6,798	.901

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Table 2-3 - ANOVA Results:
NON-GROUPED MOTIVATIONS by
[Frequency of Use by Gender]

MOTIVATIONS	Approx. F	D.F.	α
M3 - ENCOURAGED BY BOSS			
Main Effects:		346	
Frequency of Use (L/M/H)	10.00	2	.000*
Gender (M/W)	0.21	1	.649
Interaction	0.81	2	.447
M4 - ENCOURAGED BY SPOUSE			
Main Effects:		290	
Frequency of Use (L/M/H)	1.34	2	.263
Gender (M/W)	0.03	1	.866
Interaction	2.81	2	.062
M13- CONTACT CAREGIVER			
Main Effects:		253	
Frequency of Use (L/M/H)	0.09	2	.918
Gender (M/W)	19.18	1	.000*
Interaction	0.86	2	.424
M14- ENHANCE STATUS			
Main Effects:		407	
Frequency of Use (L/M/H)	0.06	2	.941
Gender (M/W)	1.97	1	.161
Interaction	1.01	2	.365

**Table 2-4 - Univariate Comparison:
Job-Related Motivations by Frequency of Use**

MOTIVATIONS	F	D.F.	α
M1 - MORE JOB CONTROL	3.40	2,349	.035*
M2 - FASTER TURNAROUND TIME	6.19	2,349	.002*
M7 - STAY IN TOUCH WITH CLIENTS	8.18	2,349	.000*
M9 - REARRANGE WORK SCHEDULE	1.56	2,349	.211
M10- REMAIN COMPETITIVE	3.32	2,349	.037*

**Table 2-5 - Discriminant Analysis Results:
Job-Related Motivations by Frequency of Use**

MOTIVATIONS	UNIV. SIGNIF.	SDFC	SC	DISC. RATIO COEFF.	MULTIV. DISCRIM- INATOR	IMPOR- TANCE
+M1 - MORE JOB CONTROL	Yes	-.274	-.614	.168	Yes	4
M2 - FASTER TURNAROUND TIME	Yes	.370	.701	.259	Yes	2
M7 - STAY IN TOUCH WITH CLIENTS	Yes	.589	.851	.501	Yes	1
M9 - REARRANGE WORK SCHEDULE	No	-.062	.364	-.023	No	
M10- REMAIN COMPETITIVE	Yes	.151	.621	.094	No	

Key: SDFC = Standardized Discriminant Function Coefficient
 SC = Structure Coefficient
 Disc. Ratio Coeff. = Discriminant Ratio Coefficient = SDFC X SC
 + = Scale Reversing Data Transformation

Figure 6 - Group Centroid Plot for Job Motivations Related to Frequency of Use

Table 2-6 - Univariate Comparison:
Personal Motivations by Frequency of Use

MOTIVATIONS	F	D.F.	α
M6 - SAFETY AND SECURITY	1.45	2,402	.235
M8 - PEOPLE CAN REACH ME	4.94	2,402	.008*
M11- SCHEDULE FREE TIME	1.02	2,402	.363

Table 2-7 - Discriminant Analysis Results:
Personal Motivations by Frequency of Use

MOTIVATIONS	UNIV. SIGNIF.	SDFC	SC	DISC. RATIO COEFF.	MULTIV. DISCRIM- INATOR	IMPOR- TANCE
+M6 - SAFETY AND SECURITY	Yes	.159	.075	.012	No	
M8 - PEOPLE CAN REACH ME	Yes	1.046	.946	.990	Yes	1
M11- SCHEDULE FREE TIME	Yes	-.259	.003	-.001	No	

Key: SDFC = Standardized Discriminant Function Coefficient
 SC = Structure Coefficient
 Disc. Ratio Coeff. = Discriminant Ratio Coefficient = SDFC X SC
 + = Scale Reversing Data Transformation

Figure 7 - Group Centroid Plot for Personal Motivations Related to Frequency of Use

Figure 8 - Group Centroid Plot for M3 Related to Frequency of Use

Question #3: Motivations Related to Parental Status

Results

Question three examined whether parental status made a difference as to why people elected to use a cellular telephone. Table 3-1 presents the means and standard deviations for the parental status by gender breakdowns for each of the fourteen motivations. It should be noted that for M1-More Job Control and M6-Safety and Security, due to the data transformations, low scores mean greater agreement with the motivations. Multivariate results for the grouped motivations (i.e. job, family and personal) are given in Table 3-2. Table 3-3 presents the univariate results for the non-grouped motivations for question two.

No significant multivariate differences were found between parental status and the job ($\alpha = .56$), family ($\alpha = .36$) and personal ($\alpha = .77$) motivations. No significant univariate differences were found between parental status and M3-Encouraged by Boss ($\alpha = .22$), M4-Encouraged by Spouse ($\alpha = .94$) and M14-Status Enhancement ($\alpha = .70$). No ANOVA was done for M13-Contact Caregiver since this motivation only applied to parents. No significant interactions were observed between parental status and gender for any of the motivations included in this analysis.

Discussion

According to the results, the added responsibility of children did not significantly affect how the respondents felt about the two family motivations (M12-Manage family life and M5-Balance work and home). In addition, parental

status was not moderating the relationship between gender and the motivations to use a cellular telephone.

Despite these findings, it is possible that parental status might have an influence on a person's reasons for choosing to use a cellular telephone. It is difficult to draw any strong conclusions concerning the impact of parental status given the sample demographics. Thirty-six percent of the children reported by the respondents were over the age of nineteen. These children may no longer be living at home and their parents might have responded to the survey more like non-parents, thus blurring the impact of parental status to the point where no significant effect could be achieved. The literature (Googins & Burden 1987) and the demographic data from this research also show that women tend to share a disproportionate amount of the responsibility for household management and child care. Given this evidence, it is difficult to conclude, with any degree of certainty, whether or not parental status has an impact on a person's motivations for using a cellular telephone.

**Table 3-1 - Means and Standard Deviations:
MOTIVATIONS by [Parental] Status by Gender]**

	PARENTS				NON-PARENTS			
	MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
JOB								
+M1-MORE JOB CONTROL	1.44	.361	1.45	.368	1.40	.359	1.25	.297
*M2-FASTER TURNAROUND	.702	.291	.683	.294	.710	.302	.723	.273
*M7-STAY IN TOUCH WITH CLIENTS	.792	.265	.747	.296	.798	.284	.843	.254
*M9-REARRANGE SCHEDULE	.759	.281	.760	.277	.829	.261	.829	.249
M10-REMAIN COMPETITIVE	3.30	1.10	3.71	1.18	4.10	1.10	4.15	.908
FAMILY								
M5-BALANCE WORK AND HOME	3.24	1.15	3.23	1.13	3.81	1.22	3.43	1.06
12-MANAGE FAMILY LIFE	3.11	1.09	3.19	1.10	3.75	1.05	3.57	1.17
PERSONAL								
+M6-SAFETY & SECURITY	.634	.297	.659	.298	.808	.270	.818	.217
*M8-PEOPLE CAN REACH ME	.791	.269	.799	.283	.786	.292	.824	.279
M11-SCHEDULE FREE TIME	3.23	1.22	3.54	1.30	3.84	1.03	3.74	1.12
NON-GROUPED								
M3-ENCOURAGED BY BOSS/COLLEAGUES	3.27	1.24	3.44	1.20	3.14	1.34	3.33	1.17
M4-ENCOURAGED BY SPOUSE	2.49	1.19	2.67	1.07	2.63	1.34	2.48	1.17
M13-CONTACT CAREGIVER	3.03	1.27	2.75	1.22	3.99	1.22	2.67	.970
M14-ENHANCE STATUS	2.86	1.19	2.78	1.06	3.01	1.26	2.99	1.12

Key: S.D. = Standard Deviation
 * = Regular Data Transformation
 + = Scale Reversing Data Transformation

Table 3-2 - MANOVA Results:
GROUPED MOTIVATIONS BY [Parental Status by Gender]

MOTIVATIONS	Hotelling's T^2	Approx. F	D.F.	α
JOB-RELATED				
Main Effects:				
Parental Status (P/N-P)	.011	0.79	5,351	.555
Gender (M/W)	.040	2.84	5,351	.016*
Interaction	.017	1.21	5,351	.302
FAMILY-RELATED				
Main Effects:				
Parental Status (P/N-P)	.006	1.02	2,346	.360
Gender (M/W)	.044	7.65	2,346	.001*
Interaction	.005	0.86	2,346	.424
PERSONAL				
Main Effects:				
Parental Status (P/N-P)	.003	0.37	3,406	.772
Gender (M/W)	.086	11.59	3,406	.000*
Interaction	.008	1.14	3,406	.331

Table 3-3 - ANOVA Results:
NON-GROUPED MOTIVATIONS by [Parental Status by Gender]

MOTIVATIONS	Approx. F	D.F.	α
<u>GENERAL MOTIVATIONS:</u>			
M3 - ENCOURAGED BY BOSS			
Main Effects:		352	
Parental Status (P/N-P)	1.52	1	.218
Gender (M/W)	0.65	1	.420
Interaction	0.00	1	.944
M4 - ENCOURAGED BY SPOUSE			
Main Effects:		295	
Parental Status (P/N-P)	0.01	1	.937
Gender (M/W)	0.02	1	.891
Interaction	0.94	1	.334
M13- CONTACT CAREGIVER			
NOT DONE - THIS MOTIVATION AFFECTS PARENTS ONLY			
M14- ENHANCE STATUS			
Main Effects:		414	
Parental Status (P/N-P)	0.14	1	.704
Gender (M/W)	1.97	1	.162
Interaction	0.04	1	.837

Question #4: Parental Status/Frequency of Use Interaction

Results

Question four asked if parental status acted as a moderating variable in the relationships tested in the framework between frequency of cellular telephone use and the perceived consequences. Table 4-1 provides the means and standard deviations for the 3X2 MANOVA [Frequency of Use by Parental Status] for the grouped perceived consequences of perceived work productivity, time management, perceived control and stress, work-family conflict and job and life satisfaction and for the 3X2 ANOVA for family satisfaction. Table 4-2 provides the multivariate results of the 3X2 MANOVA and the univariate results of the 3X2 ANOVA.

No significant interaction effect was observed for either the grouped perceived consequences or family satisfaction. The data indicated that parental status did not act as a moderating variable in the relationship between frequency of cellular telephone use and the ability to balance work and family.

Discussion

Question four asked if increased use of a cellular telephone helped parents to better balance their work and family demands. At first glance, the results seemed to indicate that this was not the case. While there were slight differences between parents and non-parents concerning the perceived consequences, these differences did not seem to be affected by the respondent's frequency of cellular telephone use.

According to Kelly and Voydanoff (1985), being a parent increases the potential for strain, conflict and stress. In other words, it would be expected that parents would have higher levels of work-family conflict, perceived stress and lower levels of time management and family satisfaction. This should be particularly evident in the case of parents who are heavy cellular telephone users since this research has shown that heavy users have significantly higher work demands than light users (see Appendix 7). Therefore, parents who are heavy cellular users should be more likely to suffer from role overload and interference (Kelly & Voydanoff, 1985) given their extra work and family responsibilities.

This did not appear to be the case, however, as the results showed that parents with heavy workloads had the same ability to balance work and family demands as childless respondents with lighter workloads. There appears to be a factor at work which is "levelling the playing field" between these two groups. It is possible that the cellular telephone is acting as a mechanism which allows parents with heavy workloads to better balance work and family demands so they experience the same types of consequences as people who have fewer responsibilities. It is difficult to draw strong conclusions on the impact of parental status, however, given the sample demographics (please refer to the results from Question Three).

**Table 4-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by [Frequency of Use by Parental Status]**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	PARENTS		NON-PARENTS		PARENTS		NON-PARENTS		PARENTS		NON-PARENTS	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
GROUPED												
PERCEIVED WORK PRODUCTIVITY (1)	3.64	.619	3.66	.645	3.88	.822	4.07	.533	4.14	.723	4.19	.660
PERCEIVED WORK PRODUCTIVITY (2)	3.19	.427	3.14	.402	3.29	.452	3.30	.500	3.39	.492	3.38	.519
TIME MANAGEMENT	3.08	.875	3.00	.972	2.85	.639	3.00	.863	2.68	.821	2.82	.943
PERCEIVED CONTROL	4.01	.691	4.11	.745	4.15	.677	4.09	.684	4.17	.646	4.19	.590
PERCEIVED STRESS	2.22	.672	2.32	.806	2.13	.625	2.35	.757	2.24	.698	2.33	.589

Key: S.D. = Standard Deviation

**Table 4-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by [Frequency of Use by Parental Status]
(Continued)**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	PARENTS		NON-PARENTS		PARENTS		NON-PARENTS		PARENTS		NON-PARENTS	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
WORK-FAMILY CONFLICT	3.09	.776	3.24	.753	3.22	.693	3.08	.935	3.29	.819	3.25	.732
WORK SATISFACTION	3.92	.825	3.90	.773	3.89	.779	3.83	.955	3.87	.809	3.98	.648
LIFE SATISFACTION	3.44	.875	3.53	.943	3.48	.789	3.56	.995	3.40	.945	3.55	.882
NON-GROUPED												
+FAMILY SATISFACTION	1.29	.270	1.40	.325	1.30	.298	1.27	.366	1.36	.320	1.32	.283

Key: S.D. = Standard Deviation
+ = Scale Reversing Data Transformation

Table 4-2 - MANOVA/ANOVA Results:
GROUPED AND NON-GROUPED PERCEIVED CONSEQUENCES by
[Frequency of Use by Parental Status]

PERCEIVED CONSEQUENCES	Hotelling's T ²	Approx. F	D.F.	α
GROUPED (MANOVA)				
Main Effects:				
Frequency of Use (L/M/H)	.133	3.54	16,850	.000*
Parental Status (P/N-P)	.036	1.89	8,426	.059
Interaction	.017	0.45	16,850	.968
FAMILY SATISFACTION (ANOVA)				
Main Effects:			416	
Frequency of Use (L/M/H)	----	1.04	2	.355
Parental Status (P/N-P)	-- --	0.06	1	.803
Interaction	----	1.89	2	.152

Question #5: Motivations Related to Gender

Results

Question five addressed the issue of whether gender made a difference when people elected to use a cellular telephone. Gender was analyzed using the six 3X2 MANOVAS and the eight 3X2 ANOVAs which were calculated to answer questions two and three (i.e. [Frequency of Use by Gender] and [Parental Status by Gender]). Tables 2-1 and 3-1 provide a breakdown of the means and standard deviations for these MANOVAs and ANOVAs. Similarly, Tables 2-2 and 3-2 present the multivariate results for the grouped motivations and Tables 2-3 and 3-3 present the univariate results for the non-grouped motivations.

As could be seen from Tables 2-2 and 3-2, the gender main effect showed multivariate significance for the job ($\alpha = .043$ and $.016$), family ($\alpha = .000$) and personal ($\alpha = .000$) motivation groups. Univariate significance was found for the non-grouped motivation dealing with M13-Contacting a Caregiver ($\alpha = .000$) (see Tables 2-3 and 3-3). No differences were observed between men and women for the motivations of encouragement by a boss (M3), encouragement by a spouse (M4) and status enhancement (M14).

No significant interactions were observed between gender and parental status or gender and frequency of use.

Follow-up analysis: job-related motivations.

Table 5-1 provides the univariate follow-up for the job-related motivations. Univariate significance was found for the job-related motivations of M1-More Job Control, M9-Rearranging Work Schedule and M10-Remaining Competitive for

both 3X2 MANOVAs. Looking at the means in Table 2-1, it appears that women were significantly more likely than men to use a cellular telephone because it gave them more job control, helped them rearrange their work schedules and made them more competitive in their work domains.

The Discriminant Analysis on gender (see table 5-2) showed the same three motivations to be the most important in terms of discriminating between male and female users. M1-More Job Control was the most important discriminator. M10-Remaining Competitive was the second most important discriminator while M9-Rearrange Work Schedule ranked third.

Since a transformed version of M1 was used for this analysis, the direction of the discriminant correlation had to be reversed when interpreting the results. The negative correlations in the discriminant analysis in Table 5-2 distinguished a group of cellular users who disagreed with (i.e. had low scores on) more job control, remaining competitive and rearranging a work schedule. According to the group centroid plot in Figure 9, men had a higher mean score than women. Therefore, the results could be interpreted as saying that overall, more men than women disagreed with M1, M10 and M9 as important motivations for using a cellular telephone. In other words, men were less likely than women to agree that M1, M9 and M10 were important reasons for using a cellular telephone. These findings were identical to those observed with the univariate tests.

Follow-up analysis: family-related motivations.

Table 5-3 provides the univariate results for the family motivations. Univariate significance was found for both M5-Balance Work and Family and

M12-Manage Family Life for both 3X2 MANOVAs. The means in Table 2-1 indicated that women were significantly more likely than men to agree that they used a cellular telephone to help them balance work and family and manage family demands.

From Table 5-4 it was apparent that while both family motivations were capable of discriminating between men and women, M12-Manage Family Life was much more important to the discrimination than M5-Balance Work and Family. According to the group centroid plot in Figure 10, women had a higher mean than men. Therefore, more women than men agreed that the family motivations were important reasons for using a cellular telephone. These results were identical to those observed for the univariate tests.

Follow-up analysis: personal motivations

Table 5-5 gives the univariate results of the two 3X2 MANOVAs for the personal motivations. The two motivations of M6-Safety and Security and M11-Scheduling Free Time showed univariate significance. The means in Table 2-1 indicated that women were significantly more likely than men to agree that these were important reasons for using a cellular telephone.

Table 5-6 provides the results of the follow-up Discriminant Analysis. The results were interpreted in light of the fact that a transformation had been done on M6 which caused the scores to be reversed.

The most important personal discriminator appeared to be the motivation of safety and security (M6). The motivation for scheduling free time (M11) was also important. Both motivations were correlated with the discriminant function

in a negative direction (when M6 was considered in its original form) which indicated that the discriminating group had low scores on these variables. A group centroid plot is provided in Figure 11. Men had the higher group mean and it could be concluded that they disagreed more often than the women that safety and security and the ability schedule free time were important reasons for using a cellular telephone.

Follow-up analysis: non-grouped motivations.

Table 5-7 provides the univariate results of the two 3X2 ANOVAs for M13 - Contact caregiver. Both ANOVAs showed significant gender differences for this motivation. A group centroid plot (Figure 12) showed that women had higher scores on this motivation. It appeared that they agreed more often than men that the ability to contact one's caregiver was an important reason for using a cellular telephone.

Discussion

Both univariate and Discriminant analyses showed that women were significantly more likely than men to agree that the following motivations were important reasons for using a cellular telephone:

- More job control (M1)
- Remaining competitive (M10)
- Rearranging a work schedule (M9)
- Balancing work and family (M5)
- Managing family life (M12)
- Safety and security (M6)
- Scheduling free time (M11)
- Contacting a caregiver (M13)

The literature suggests several reasons why it is more likely that women would be more attracted than men to mechanisms which would help them cope

more easily with their extra tasks and balance their simultaneous work and family demands.

First, according to Googins and Burden (1987), Rice (1979), Pleck (1977) and Bohen and Viveros-Long (1981), women tend to experience considerably more role overload and interference than men since they are usually more responsible for household management and child care. Second, women also often have more problems than men balancing competing work and family responsibilities because of the simultaneous nature of their demands (Hall & Richter, 1988). Men often have fewer difficulties because their work and family role demands are sequential.

The results from this study support this contention. Women far outranked men in their agreement that being able to manage their family lives was an important reason for using a cellular telephone. They also appreciated the ability to contact their child's caregiver during the work day. Furthermore, women agreed more than men that having more control over job location and timing and being able to rearrange their work schedules at the last minute and schedule their free time were important motivations for using a cellular phone. These findings suggest that women, more than men, are attracted to cellular phone technology by the increased work time and work location flexibility it offers. Such flexibility increases a woman's ability to manage uncertainty in both the work and family domains. Men who have the opportunity to separate work from family and compartmentalize their roles (Hall & Richter, 1988, Pleck, 1977) have less of a need for a cellular phone for such purposes.

Finally, the finding that remaining competitive was the second most important job motivation for women was very interesting. It would appear that as women move into positions of importance which have traditionally been held only by men, they are likely to realize that to compete and advance in their careers it is vital to have access to any tool that can give them an edge over their competitors. It may also be that the greater family responsibilities that they must contend with also increase their need for a tool which will "level the playing field" (i.e. help them compete with colleagues who have fewer work and family demands).

**Table 5-1 - Univariate Comparison:
Job-Related Motivations by Gender**

MOTIVATIONS	FROM MANOVA: FREQUENCY OF USE BY GENDER			FROM MANOVA: PARENTAL STATUS BY GENDER		
	F	D.F.	α	F	D.F.	α
M1 - MORE JOB CONTROL	5.13	1,349	.024*	8.92	1,355	.003*
M2 - FASTER TURNAROUND TIME	0.01	1,349	.918	0.48	1,355	.488
M7 - STAY IN TOUCH WITH CLIENTS	0.29	1,349	.588	2.63	1,355	.106
M9 - REARRANGE WORK SCHEDULE	5.52	1,349	.019*	4.82	1,355	.029*
M10- REMAIN COMPETITIVE	4.61	1,349	.033*	8.83	1,355	.003*

**Table 5-2 - Discriminant Analysis Results:
Job-Related Motivations by Gender**

MOTIVATIONS	UNIV. SIGNIF.	SDFC	SC	DISC. RATIO COEFF.	MULTIV. DISCRIM- INATOR	IMPOR- TANCE
+M1 - MORE JOB CONTROL	Yes	.628	.765	.480	Yes	1
M2 - FASTER TURNAROUND TIME	No	.316	-.137	-.043	No	
M7 - STAY IN TOUCH WITH CLIENTS	No	.098	-.339	-.033	No	
M9 - REARRANGE WORK SCHEDULE	Yes	-.342	-.591	.202	Yes	3
M10- REMAIN COMPETITIVE	Yes	-.513	-.768	.394	Yes	2

Key: SDFC = Standardized Discriminant Function Coefficient
 SC = Structure Coefficient
 Disc. Ratio Coeff. = Discriminant Ratio Coefficient = SDFC X SC
 + = Scale Reversing Data Transformation

Figure 9 - Job Motivations Group Centroid Plot for Gender

**Table 5-3 - Univariate Comparison:
Family-Related Motivations by Gender**

MOTIVATIONS	FROM MANOVA: FREQUENCY OF USE BY GENDER			FROM MANOVA: PARENTAL STATUS BY GENDER		
	F	D.F.	α	F	D.F.	α
M5 - BALANCE WORK AND FAMILY	9.73	1,340	.002*	7.67	1,347	.006*
M12- MANAGE FAMILY LIFE	18.49	1,340	.000*	14.40	1,347	.000*

**Table 5-4 - Discriminant Analysis Results:
Family-Related Motivations by Gender**

MOTIVATIONS	UNIV. SIGNIF.	SDFC	SC	DISC. RATIO COEFF.	MULTIV. DISCRIM- INATOR	IMPOR- TANCE
M5 - BALANCE WORK AND FAMILY	Yes	.704	.280	.197	Yes	3
M12- MANAGE FAMILY LIFE	Yes	.971	.927	.803	Yes	1

Key: SDFC = Standardized Discriminant Function Coefficient
 SC = Structure Coefficient
 Disc. Ratio Coeff. = Discriminant Ratio Coefficient = SDFC X SC

Figure 10 - Family Motivations Group Centroid Plot for Gender

**Table 5-5 - Univariate Comparison:
Personal Motivations by Gender**

MOTIVATIONS	FROM MANOVA: FREQUENCY OF USE BY GENDER			FROM MANOVA: PARENTAL STATUS BY GENDER		
	F	D.F.	α	F	D.F.	α
M6 - SAFETY AND SECURITY	29.24	1,402	.000*	29.50	1,408	.000*
M8 - PEOPLE CAN REACH ME	0.07	1,402	.786	0.11	1,408	.743
M11- SCHEDULE FREE TIME	17.77	1,349	.000*	10.52	1,408	.001*

**Table 5-6 - Discriminant Analysis Results for
Impact of Gender on Personal Motivations**

MOTIVATIONS	UNIV. SIGNIF.	SDFC	SC	DISC. RATIO COEFF.	MULTIV. DISCRIM- INATOR	IMPOR- TANCE
+M6 - SAFETY AND SECURITY	Yes	.880	.785	.691	Yes	1
M8 - PEOPLE CAN REACH ME	No	-.062	.156	-.010	No	
M11- SCHEDULE FREE TIME	Yes	-.645	-.495	.320	Yes	2

Key: SDFC = Standardized Discriminant Function Coefficient
 SC = Structure Coefficient
 Disc. Ratio Coeff. = Discriminant Ratio Coefficient = SDFC X SC
 + = Scale Reversing Data Transformation

Figure 11 - Personal Motivations Group Centroid Plot for Gender

**Table 5-7 - Univariate Comparison:
M13-Contact Caregiver by Gender**

MOTIVATIONS	FROM ANOVA: FREQUENCY OF USE BY GENDER			FROM ANOVA: PARENTAL STATUS BY GENDER		
	F	D.F.	α	F	D.F.	α
M13- CONTACT CAREGIVER	19.18	1,253	.000*	29.50	1,408	.000*

Figure 12 - M13-Contact Caregiver Plot for Gender

Question #6: Gender/Frequency of Use Interaction

Results

Question six asked if gender acted as a moderating variable in the relationships tested in the framework between frequency of cellular telephone use and the perceived consequences. Table 6-1 provides the means and standard deviations for the 3X2 MANOVAs [Frequency of Use by Gender] for the grouped perceived consequences of perceived work productivity, time management, perceived control and stress, work-family conflict and job and life satisfaction and for the 3X2 ANOVA for family satisfaction. Table 6-2 provides the multivariate results of the 3X2 MANOVA and the univariate results of the 3X2 ANOVA.

For the grouped perceived consequences, the interaction effect between gender and frequency of use approached significance at $\alpha = .089$. There were also significant differences between the gender and the frequency of use groups. No significant interaction effect was observed for family satisfaction nor were there any significant differences between the gender or the frequency of use groups.

Follow-up analysis: interaction of gender and frequency of use.

Table 6-3 provides the univariate results of the interaction. Perceived control and work satisfaction showed univariate significance for the interaction between gender and frequency of use. This implied that gender was acting as a moderating variable in the relationship between frequency of use and these two perceived consequences. None of the other perceived consequences considered in this analysis showed univariate significance for the interaction effect.

While the interactions for perceived control and work satisfaction were small, they were examined in light of the exploratory nature of the research. Plots of the cell means for perceived control and work satisfaction are provided in Figures 13 and 14.

According to the graph in Figure 13, gender moderated the relationship between frequency of use and perceived control. For women, the mean of perceived control increased from 4.04 to 4.33 between light and medium users and then decreased to 4.19 for heavy users. The men showed an opposite curve in that perceived control decreased from 4.04 to 3.96 between light and medium users and then increased to 4.17 for heavy users.

In other words, the men's perceived control appeared to decrease slightly as their frequency of use increased from light to medium. The difference was less than .10, however, and was considered to be negligible. The real increase in perceived control was between medium and heavy users. Therefore, it could be said that the men's perceived control was fairly similar for light and medium users and increased for heavier users. The women's perceived control increased as their use increased from light to medium, but then decreased as their use became heavier.

The case of work satisfaction was similar to that of perceived control in that men and women had very different frequency of use curves for this consequence. Interpreting the graph for the men (Figure 14), work satisfaction started out high for the light users (mean = 3.97), dropped for the medium users (3.72) and then picked up again for the heavy users (3.92). Women experienced the

opposite pattern with light users showing lower work satisfaction at a mean of 3.83, medium users edging up to 4.03 and then heavy users decreasing to 3.90.

In other words, men who were light and heavy users experienced higher levels of work satisfaction than men who were medium users. Conversely, women who were light and heavy users exhibited lower levels of work satisfaction than women who were medium users.

Discussion

Overall, it appeared that as the men's frequency of use increased, they experienced increases in perceived control. The women's perceived control also increased the more they used their phones, but they seemed to experience a point of diminishing returns. Since their perceived control did not simply level off but actually noticeably decreased, it was concluded that, for the women, having a cellular telephone might have become counterproductive after a certain point.

Turning to work satisfaction, men seemed to experience a sharp drop as their frequency of use increased, but it picked up again when their use became heavier. Women, on the other hand, had increased work satisfaction as their use increased, but it reached a levelling off point where it seemed to decrease the more they used their phones.

The perceived control and work satisfaction results appeared to parallel each other. This is logical since it makes sense to assume that a lower level of perceived control would most likely lead to a lower level of work satisfaction. In other words, the less in control workers feel they are, the less satisfied they

are with their jobs.

Men and women seemed to have opposite patterns of work satisfaction and perceived control, depending on their frequency of use. Various factors could be responsible for these results, including the types of jobs they have and the amount of actual work and family demands they experience on a daily basis. For example, the demographics of this sample showed that significantly more women than men were employed in sales positions (women = 36%, men = 13.5%). If a job requires a lot of travelling and the worker needs to maintain contact with the office on a regular basis, they might experience higher perceived control, and subsequently work satisfaction, if regular use of a cellular telephone helps to alleviate the communication problem. If the use becomes too heavy and intrusive, the worker might begin to experience decreasing levels of productivity and satisfaction. Another factor which may be influencing the drop in women's perceived control and work satisfaction at heavier levels of use is their greater propensity for role overload and interference (Bohen & Viveros-Long, 1981) caused by their simultaneous work and family demands.

**Table 6-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender]**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
GROUPED												
PERCEIVED WORK PRODUCTIVITY (1)	3.68	.628	3.57	.616	3.91	.728	3.98	.748	4.12	.768	4.18	.601
PERCEIVED WORK PRODUCTIVITY (2)	3.16	.427	3.21	.408	3.28	.444	3.31	.497	3.39	.509	3.40	.489
TIME MANAGEMENT	3.07	.919	3.05	.875	2.83	.730	3.00	.719	2.83	.848	2.63	.872
PERCEIVED CONTROL	4.04	.711	4.04	.700	3.96	.731	4.33	.556	4.17	.571	4.19	.689
PERCEIVED STRESS	2.26	.691	2.22	.745	2.21	.641	2.20	.730	2.18	.711	2.36	.595

Key: S.D. = Standard Deviation

Table 6-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES BY
[Frequency of Use by Gender]
(Continued)

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
WORK-FAMILY CONFLICT	3.08	.789	3.21	.739	3.14	.772	3.21	.810	3.15	.821	3.41	.714
WORK SATISFACTION	3.97	.769	3.83	.870	3.72	.853	4.03	.805	3.92	.767	3.90	.742
LIFE SATISFACTION	3.39	.896	3.58	.881	3.40	.817	3.63	.910	3.38	.907	3.56	.966
NON-GROUPED												
+FAMILY SATISFACTION	1.30	.264	1.30	.304	1.34	.303	1.23	.323	1.37	.336	1.33	.279

Key: S.D. = Standard Deviation
+ = Scale Reversing Data Transformation

Table 6-2 - MANOVA/ANOVA Results:
GROUPED AND NON-GROUPED PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender]

PERCEIVED CONSEQUENCES	Hotelling's T^2	Approx. F	D.F.	α
GROUPED				
Main Effects:				
Frequency of Use (L/M/H)	.160	4.24	16,850	.000*
Gender (M/W)	.052	2.76	8,426	.005*
Interaction	.057	1.50	16,850	.089
FAMILY SATISFACTION				
Main Effects:			416	
Frequency of Use (L/M/H)	----	1.38	2	.253
Gender (M/W)	----	2.76	1	.098
Interaction	----	1.02	2	.361

Table 6-3 - Univariate Comparison:
GROUPED PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender] Interaction

PERCEIVED CONSEQUENCES	F	D.F.	α
PERCEIVED WORK PRODUCTIVITY (1)	3.40	2,349	.395
PERCEIVED WORK PRODUCTIVITY (2)	6.19	2,349	.932
TIME MANAGEMENT	8.18	2,349	.238
PERCEIVED CONTROL	1.56	2,349	.042*
PERCEIVED STRESS	1.56	2,349	.410
WORK-FAMILY CONFLICT	1.56	2,349	.643
WORK SATISFACTION	1.56	2,349	.045*
LIFE SATISFACTION	3.32	2,349	.978

Figure 13 - Plot of Gender/Frequency of Use Interaction for Perceived Control

Figure 14 - Plot of Gender/Frequency of Use Interaction for Work Satisfaction

Question #7: Motivations Related to Work Demands

Results

Question seven examined whether work demands influenced why people elected to use a cellular telephone. Three two group MANCOVAs and four two group ANCOVAs were performed for the grouped and non-grouped motivations with gender as the grouping variable and work demands as the covariates. Multiple regressions were performed for those motivations that showed multivariate significance for work demands.

Table 7-1 has a breakdown of the means and standard deviations for the grouped and non-grouped motivations by gender with work demands. Tables 7-2 and 7-3 present the multivariate results for the grouped motivations and the univariate results for the non-grouped motivations for question seven.

The MANCOVAs for the job, family and personal motivations and the ANCOVAs for the non-grouped motivations of M4-Encouragement by a Spouse and M13-Contacting a Caregiver did not show significant main effects for work demands. None of the interaction between work demands and gender for any of the motivations were significant.

There were significant main effects for the motivations of M3-Encouragement by a Spouse ($\alpha = .032$) and M14-Status Enhancement ($\alpha = .018$). There were no significant gender differences for either of these two motivations. This indicated that while work demands may influence the extent to which respondents agreed with these two motivations, there were no significant differences in agreement between men and women.

Follow-up analysis: Impact of Work Demands on M3-Encouragement by Boss and M14-Status Enhancement.

Tables 7-4 and 7-5 provide the overall results of the multiple regressions for M3 and M14, including the beta weights, zero-order correlations and part correlation coefficients.

The overall R-square from Table 7-4 was .01893 which meant that work demands were accounting for approximately 2% of the variance in M3-Encouragement by Boss and/or Colleagues. Ten percent is generally considered to be the cut-off point for interpretation of variance in social science research (Tabachnick & Fidell, 1983). Consequently, this result was considered to be a capitalization on chance and, therefore, spurious.

The overall R-square value from Table 7-5 was .01986 which meant that work demands accounted for approximately 2% of the variance in M14-Status Enhancement among friends and/or colleagues. This result was considered to be spurious for the same reasons as were given for the first regression.

Discussion

Given the results, it was concluded that different levels of work demands did not have a substantial impact on the respondents' reasons for using their cellular telephones. This was not to say that work demands, as a factor, did not enter into the picture when someone was deciding to acquire a cellular telephone. Rather, it would appear that the reasons for using the technology, as put forth in this research, did not vary according to how high or low the demands were.

There is, however, a link between frequency of cellular telephone use and work demands. As shown in Appendix 7, more frequent cellular users do have higher levels of work demands. This may be an indication that the harder a person works, the greater their need is for tools that can help them cope with their heavy workload.

**Table 7-1 - Means and Standard Deviations:
MOTIVATIONS by [Gender] with Work Demands**

JOB	MEN		WOMEN	
	Mean	S.D.	Mean	S.D.
JOB				
+M1 - MORE JOB CONTROL	1.44	.363	1.34	.337
#M2 - FASTER TURNAROUND	.697	.291	.713	.288
#M7 - STAY IN TOUCH WITH CLIENTS	.786	.271	.819	.271
#M9 - REARRANGE SCHEDULE	.762	.281	.826	.256
M10- REMAIN COMPETITIVE	3.78	1.12	4.12	1.01
TOTAL WORK HOURS	11.75	3.97	11.37	3.78
WORK INVOLVEMENT	3.24	.930	3.21	.942
FAMILY				
M5 - BALANCE WORK AND HOME	3.23	1.15	3.66	1.17
M12- MANAGE FAMILY LIFE	3.12	1.01	3.68	1.10
TOTAL WORK HOURS	11.43	3.64	11.76	3.69
WORK INVOLVEMENT	3.21	.973	3.22	.934

Key: S.D. = Standard Deviation
 # = Regular Data Transformation
 + = Scale Reversing Data Transformation

**Table 7-1 - Means and Standard Deviations:
MOTIVATIONS by [Gender] with Work Demands (Continued)**

	MEN		WOMEN	
	Mean	S.D.	Mean	S.D.
PERSONAL				
+M6 - SAFETY AND SECURITY	1.38	.362	1.19	.292
#M8 - PEOPLE CAN REACH ME	.795	.272	.808	.286
M11- SCHEDULE FREE TIME	3.28	1.25	3.77	1.08
TOTAL WORK HOURS	11.33	3.77	10.90	3.51
WORK INVOLVEMENT	3.17	.940	3.22	.939
NON-GROUPED				
M3 - ENCOURAGED BY BOSS/COLLEAGUES	3.31	1.22	3.24	1.26
TOTAL WORK HOURS	11.37	3.65	10.95	3.63
WORK INVOLVEMENT	3.26	.949	3.29	.906
M4 - ENCOURAGED BY SPOUSE	2.51	1.18	2.55	1.26
TOTAL WORK HOURS	11.35	3.45	11.20	3.68
WORK INVOLVEMENT	3.24	.967	3.30	.897
M13- CONTACT CAREGIVER	2.99	1.26	3.73	1.29
TOTAL WORK HOURS	11.29	3.64	11.00	3.46
WORK INVOLVEMENT	3.24	.985	3.35	.904
M14- ENHANCE STATUS	2.81	1.17	3.00	1.20
TOTAL WORK HOURS	11.45	3.77	11.01	3.72
WORK INVOLVEMENT	3.21	.938	3.20	.939

Key: S.D. = Standard Deviation
 # = Regular Data Transformation
 + = Scale Reversing Data Transformation

Table 7-2 - MANCOVA Results:
GROUPED MOTIVATIONS by
[Gender] with Work Demands

MOTIVATIONS	Hotelling's T^2	Approx. F	D.F.	α
JOB-RELATED				
Main Effects:				
Work Demands	.047	1.62	10,690	.096
Gender (M/W)	.041	2.81	5,344	.017*
Interaction	.030	1.01	10,682	.430
FAMILY-RELATED				
Main Effects:				
Work Demands	.011	0.96	4,680	.430
Gender (M/W)	.068	11.61	2,341	.000*
Interaction	.011	0.95	4,676	.432
PERSONAL				
Main Effects:				
Work Demands	.025	1.59	6,776	.146
Gender (M/W)	.104	13.45	3,389	.000*
Interaction	.021	1.37	6,772	.224

Table 7-3 - ANCOVA Results:
NON-GROUPED MOTIVATIONS by
[Gender] with Work Demands

MOTIVATIONS	Approx. F	D.F.	α
M3 - ENCOURAGED BY BOSS			
Main Effects:			
Work Demands	3.45	2,345	.032*
Gender (M/W)	0.45	1,345	.504
Interaction	0.38	2,343	.685
M4 - ENCOURAGED BY SPOUSE			
Main Effects:			
Work Demands	1.34	2,289	.264
Gender (M/W)	0.05	1,289	.824
Interaction	0.31	2,287	.731
M13- CONTACT CAREGIVER			
Main Effects:			
Work Demands	0.73	2,248	.483
Gender (M/W)	19.94	1,248	.000*
Interaction	0.47	2,246	.625
M14- ENHANCE STATUS			
Main Effects:			
Work Demands	4.05	2,399	.018*
Gender (M/W)	2.46	1,399	.113
Interaction	0.84	2,397	.432

Table 7-4 - Multiple Regression Results:
M3 - Encouragement by Boss by Work Demands

VARIABLE	BETA	CORR.	PART COR.	R ²
TOTAL WORK HOURS	-.140313	-.136266	-.137277	.018845
WORK INVOLVEMENT	.019559	-.009470	.019136	.000367

Table 7-5 - Multiple Regression Results:
M14 - Status Enhancement by Work Demands

VARIABLE	BETA	CORR.	PART COR.	R ²
TOTAL WORK HOURS	.005843	-.023515	.005717	.000033
WORK INVOLVEMENT	-.142030	-.140823	-.138963	.019311

Question #8: Work Demands/Frequency of Use Interaction**Results**

Question eight asked if work demands acted as a moderating variable in the relationships tested in the framework between frequency of cellular telephone use and the perceived consequences. Table 8-1 provides the means and standard deviations for the 3X2 MANCOVA [Frequency of Use by Gender with Work Demands] for the grouped perceived consequences of perceived work productivity, time management, perceived control and stress, work-family conflict and job and life satisfaction and for the 3X2 ANCOVA for family satisfaction. Table 8-2 provides the multivariate results of the 3X2 MANCOVA and the univariate results of the 3X2 ANCOVA.

While all three main effects of work demands, frequency of use and gender showed multivariate significance, there were no significant two-way or three-way interaction effects between them for the grouped perceived consequences. They were not significant for family satisfaction nor were there any interactions on this variable. Therefore, it was concluded that work demands were not acting as a moderating variable in the relationship between frequency of use and the perceived consequences.

Discussion

The results indicated that work demands did have an impact on the perceived consequences experienced by the respondents. This validates the findings of Pierce et al (1989) and Near, Rice and Hunt (1980) who indicate that people with differing levels of work demands will experience varying degrees of

such consequences as job and life satisfaction.

The results also showed that work demands did not cause cellular telephone users to experience varying degrees of the perceived consequences at different frequencies of cellular use. In other words, light, medium and heavy cellular telephone users would still experience the same levels of, for example, time management, no matter how high or low their respective work demands were (and cellular users did exhibit increasing levels of work demands as their frequency of use increased (Appendix 7)). This may be proof that the technology is acting as a coping mechanism which allows users to deal with heavier work demands but not suffer the negative consequences such as increased perceived stress or decreased work satisfaction.

**Table 8-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender]
With Work Demands**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
GROUPED												
PERCEIVED WORK PRODUCTIVITY (1)	3.70	.626	3.57	.619	3.91	.728	3.98	.748	4.14	.748	4.18	.601
PERCEIVED WORK PRODUCTIVITY (2)	3.16	.432	3.21	.412	3.28	.444	3.31	.497	3.40	.511	3.40	.489
TIME MANAGEMENT	3.08	.918	3.03	.876	2.83	.730	3.00	.719	2.84	.853	2.63	.872
PERCEIVED CONTROL	4.04	.714	4.05	.704	3.96	.731	4.33	.556	4.18	.573	4.19	.689
PERCEIVED STRESS	2.26	.687	2.22	.745	2.21	.641	2.20	.730	2.18	.716	2.36	.595
WORK-FAMILY CONFLICT	3.08	.793	3.20	.746	3.14	.772	3.21	.810	3.13	.799	3.41	.714

Key: S.D. = Standard Deviation

**Table 8-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender]
With Work Demands
(Continued)**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
WORK SATISFACTION	3.98	.769	3.85	.875	3.72	.853	4.04	.805	3.92	.774	3.90	.742
LIFE SATISFACTION	3.41	.886	3.58	.892	3.40	.817	3.63	.910	3.38	.914	3.56	.966
TOTAL WORK HOURS	11.21	3.87	10.55	3.51	12.12	4.53	10.85	3.51	11.77	3.30	12.36	3.69
WORK INVOLVEMENT	3.16	.946	3.17	.916	3.21	.898	3.26	.956	3.44	.946	3.27	.920
NON-GROUPED												
+FAMILY SATISFACTION	1.31	.262	1.32	.304	1.34	.304	1.23	.323	1.37	.340	1.33	.282
TOTAL WORK HOURS	10.99	3.84	10.28	3.40	11.76	3.93	10.52	3.09	11.42	2.47	12.59	3.88
WORK INVOLVEMENT	3.20	.977	3.12	.955	3.19	.912	3.35	.985	3.48	.967	3.18	.931

Key: S.D. = Standard Deviation
+ = Scale Reversing Data Transformation

Table 8-2 - MANCOVA/ANCOVA Results:
GROUPED AND NON-GROUPED PERCEIVED CONSEQUENCES
[Frequency of Use by Gender]
With Work Demands

PERCEIVED CONSEQUENCES	Hotelling's T^2	Approx. F	D.F.	α
GROUPED				
Main Effects:				
Work Demands	.351	9.15	16,834	.000*
Frequency of Use (L/M/H)	.137	3.57	16,834	.000*
Gender (M/W)	.058	3.03	8,418	.003*
Interactions:				
Work Demands/Frequency of Use /Gender	.057	0.72	32,1626	.876
Work Demands/Frequency of Use	.051	0.64	32,1626	.939
Work Demands/Gender	.044	1.13	16,814	.325
Frequency of Use/Gender	.052	1.35	16,834	.159
FAMILY SATISFACTION				
Main Effects:			395	
Work Demands	----	0.18	2	.834
Frequency of Use (L/M/H)	----	1.08	2	.340
Gender (M/W)	----	2.24	1	.135
Interactions:			385	
Work Demands/Frequency of Use /Gender	----	0.57	4	.684
Work Demands/Frequency of Use	----	1.92	4	.107
Work Demands/Gender	----	0.76	2	.470
Frequency of Use/Gender	----	1.38	2,395	.252

Question #9: Motivations Related to Family Demands

Results

Question nine examined whether family demands influenced why people elected to use a cellular telephone. Three two group MANCOVAs and four two group ANCOVAs were performed for the grouped and non-grouped motivations with gender as the grouping variable and family demands as the covariates. Canonical correlations and multiple regressions were performed for those motivations that showed multivariate significance for family demands.

Table 9-1 has a breakdown of the unadjusted means and standard deviations for the grouped and non-grouped motivations by gender with family demands. Tables 9-2 and 9-3 present the multivariate results for the grouped motivations and the univariate results for the non-grouped motivations for question nine.

Family demands were found to have a significant multivariate main effect on the job and family motivations. Since there were also significant multivariate effects for gender, separate canonical correlations were performed for men and women.

Family demands also had a significant impact on two of the non-grouped motivations: M3-Encouragement by a Boss; and M13-Contacting a Caregiver. In the case of M3, the main effect for gender was not significant so only one multiple regression had to be performed. The main effect for gender showed multivariate significance in the ANCOVA for M13 so separate regressions had to be calculated for men and women.

Family demands were not found to have significant multivariate effects on the personal motivations and the motivations for encouragement by a spouse (M4) and status enhancement (M14).

A significant interaction effect was observed between work demands and gender for the job motivations. Since there was a main gender effect causing men and women to be analyzed separately (i.e. two separate Canonical Correlations were done), the interaction effect was partialled out and, therefore, not considered to be a major concern. No other significant interactions were observed for the other motivations.

Follow-up analysis: grouped motivations.

The multivariate results for the canonical correlations indicated that family demands had an impact on both men's and women's job motivations. They also had an impact on women's family motivations. As can be seen in Table 9-4, the percentage of variance in job motivations accounted for by family demands was approximately eight percent for men and twelve percent for women. Approximately eight percent of the variance in women's family motivations was accounted for by family demands. These values were high enough to be interpreted and not be spurious.

Tables 9-5, 9-7 and 9-9 provide the standardized canonical coefficients and the correlations between the dependent variables and the canonical variables for the significant functions from Table 9-4. Tables 9-6, 9-8 and 9-10 provide the Pearson Correlation Coefficients for the relationships between the men's and women's job motivations and family demands and the women's family motiv-

ations and family demands. These correlations are for the untransformed variables in order to illustrate the exact nature and direction of the relationships between the dependent and independent variables.

Men's job-related motivations: The canonical correlations for the men's job-related motivations (Table 9-5) indicated that more job control (.496), faster turnaround time (.437) and remaining competitive (-.625) were what defined the function for the men's job motivations. An examination of the standardized coefficients showed that all these variables were large and close enough together to be considered relevant to the function. Due to the transformation done to achieve normality, more job control was actually acting in the opposite direction of the correlation in Table 9-5 (please refer to the original Pearson coefficient in Table 9-6).

On the independent variable (predictor) side, both total family hours (-.880) and family involvement (-.385) showed high correlations to the canonical function. The standardized coefficients, however, showed a wide gap between the two variables (-.927 and -.477). According to Stevens (1986), this gap was large enough to classify family involvement as redundant to the canonical function.

The canonical function showed that low scores on M1-More Job Control and M10-Remaining Competitive and a high score on M2-Faster Turnaround corresponded to a very low score on total family hours. In other words, men who disagreed with the motivations of more job control and remaining competitive and agreed with the motivation of faster turnaround time were more likely to

spend fewer hours with their families.

Women's job-related motivations: For the women's job-related motivations (Table 9-7), only more job control (M1) and remaining competitive (M10) appeared to have high enough correlations and standardized coefficients to be considered relevant to the function. On the predictor (independent variables) side, the same could be said for total family hours. As in the men's case, more job control (M1) was interpreted in view of its original relationship with total family hours (Table 9-8).

The results of the canonical functions indicated that women with high scores on M1-More Job Control and M10-Remaining Competitive were more likely to have low scores on total family hours. An interpretation of these results was that women who agreed with the motivations of more job control and remaining competitive were not as likely to spend as much time with their families.

Women's family-related motivations: For the women's family-related motivations (Table 9-9), managing family life (M12) appeared to be the most relevant dependent variable and family involvement seemed to be the most relevant independent variable. Family involvement was interpreted in the opposite direction from the canonical correlation in Table 9-9 due to the transformation of the variable (original Pearson Coefficients in Table 9-10).

The results indicated that women who agreed that managing family life was an important reason for using a cellular telephone were also very involved in the lives of their family members.

Follow-up analysis for non-grouped motivations.

M3-Encouragement by Boss: The overall R-square value for M3-Encouragement by Boss (Table 9-11) predicted by family demands was .03923. This meant that family demands accounted for approximately four percent of the variance in M3-Encouragement by Boss and/or Colleagues. As noted previously, this amount was too small to be considered to be interpretable and was, therefore, considered to be spurious (Tabachnick & Fidell, 1983).

M13-Contact Caregiver: The overall R-square values for M13-Contact Caregiver predicted by family demands were .08649 for men and .14541 for women (Table 9-12). In other words, family demands accounted for about nine percent of the variance in M13 for the men and about fifteen percent of the variance in M13 for the women.

Family involvement seemed to be the more important predictor for both men and women in terms of the tendency to agree with this motivation for adopting a cellular telephone. As indicated earlier, the transformation of family involvement changed its distribution and the direction of the relationship it had with other variables. The results were interpreted taking this into account.

The results in Table 9-12 showed that men who were more involved with their families and, to a lesser extent, devoted more time to them, were more likely to agree with the motivation of contacting a caregiver (M13). Women had the same relationship between family demands and M13, but showed a higher level of family involvement.

Discussion

Family demands seemed to have a different impact on job motivations for men and women. According to the results, men who agreed that more job control (M1) and remaining competitive (M10) were important reasons for using a cellular telephone also tended to spend more time with their families. The opposite was true for women where agreement with more job control and remaining competitive was linked to less time spent with the family.

These results are not that unusual when considered in light of the fact that family demands have been found to affect men and women differently (Hall & Richter, 1988, Pleck, 1977). Men's demands are usually sequential, meaning that work and family responsibilities are separated, while women's demands are usually simultaneous, meaning that work and family tend to interfere with each other. In addition, according to Googins and Burden (1987), women usually assume greater responsibility for household management and child care. The current survey results backed this claim up with the finding that 66% of the female respondents were responsible for arranging their children's daily care but 70% of the male respondents left this duty up to their spouses.

Going on the premise that women were responsible for a disproportionate amount of family demands, it seemed logical that as their total number of family hours increased, their interest in use of a cellular telephone for more job control and remaining competitive decreased. With higher levels of family demands to deal with, these women would most likely be interested in use of their phones for more convenient family management. This was borne out by the

results which showed that women who valued their cellular telephones for this purpose, and for contacting a child's caregiver during the work day, were more involved in their family members' lives. Apparently, in the battle between simultaneous work and family demands, women are putting their families ahead of their jobs. This high priority of family demands for women conforms to socio-cultural norms and has been mentioned frequently in the literature (i.e. Pleck, 1977, Voydanoff, 1987, Hall & Richter, 1988, Googins & Burden, 1987).

Conversely, in those cases where women do not have families (forty-two percent of the female respondents for this survey indicated that they did not have children), it seems logical to conclude that they will place a greater emphasis on more job control and remaining competitive. It is a well-known fact that, in recent years, as more women have entered the work force and begun to build careers instead of just working at jobs, many of them have also chosen to put off child rearing until a later stage in life or not to have children at all (Hayghe, 1990). Women who are more job and less family oriented, therefore, would naturally be interested in the cellular telephone as a tool to help them advance in their careers and not need it as a more effective means of family management.

Men placed more importance on using their phones to increase their job control and remaining competitive while still maintaining the time spent with their families. In other words, they appeared to want to use the cellular telephone to help them get ahead at work while minimizing disruption in their families. The literature suggests that they are more able than women to use their phones this way since they have fewer family responsibilities (Googins & Burden,

1987) which are also sequential in nature (Hall & Richter, 1988).

As the men's total time in family activities decreased, their interest in use of a cellular telephone for faster turnaround time on the job increased. As in the case of the women, men who do not have children are more likely to be more career and less family oriented. Therefore, they are also more likely to be interested in using a cellular telephone to help them in their work and not their family domains.

Finally, it was interesting to note that family demands did not have any impact on family motivations for the men. This meant that no matter how high or low their family demands were, men felt essentially the same about the importance of using their phones to manage their family responsibilities. To their credit, the men with children did seem to be use their phones to contact their child's caregiver during the work day, but this finding was not as significant as it was for the women.

**Table 9-1 - Means and Standard Deviations:
MOTIVATIONS by
[Gender] with Family Demands**

	MEN		WOMEN	
	Mean	S.D.	Mean	S.D.
JOB				
+M1 - MORE JOB CONTROL	1.43	.359	1.34	.346
#M2 - FASTER TURNAROUND	.706	.293	.720	.292
#M7 - STAY IN TOUCH WITH CLIENTS	.793	.268	.826	.270
#M9 - REARRANGE SCHEDULE	.757	.281	.826	.256
M10- REMAIN COMPETITIVE	3.78	1.10	4.13	1.04
#TOTAL FAMILY HOURS	2.81	.886	2.77	.972
+FAMILY INVOLVEMENT	.288	.184	.330	.196
FAMILY				
M5 - BALANCE WORK AND HOME	3.23	1.15	3.70	1.18
M12- MANAGE FAMILY LIFE	3.14	1.09	3.71	1.08
#TOTAL FAMILY HOURS	2.88	.843	2.92	.993
+FAMILY INVOLVEMENT	.282	.177	.303	.201
PERSONAL				
+M6 - SAFETY AND SECURITY	1.38	.361	1.18	.292
#M8 - PEOPLE CAN REACH ME	.790	.273	.800	.288
M11- SCHEDULE FREE TIME	3.26	1.24	3.77	1.09

Key: S.D. = Standard Deviation
= Regular Data Transformation
+ = Scale Reversing Data Transformation

**Table 9-1 - Means and Standard Deviations:
MOTIVATIONS by
[Gender] with Family Demands (Continued)**

	MEN		WOMEN	
	Mean	S.D.	Mean	S.D.
PERSONAL (Continued)				
#TOTAL FAMILY HOURS	2.86	.859	2.84	1.00
+FAMILY INVOLVEMENT	.283	.185	.308	.202
NON-GROUPED				
M3 - ENCOURAGED BY BOSS/COLLEAGUES	3.31	1.25	3.19	1.31
#TOTAL FAMILY HOURS	2.86	.848	2.80	.979
+FAMILY INVOLVEMENT	.278	.178	.326	.201
M4 - ENCOURAGED BY SPOUSE	2.51	1.19	2.56	1.29
#TOTAL FAMILY HOURS	2.87	.835	2.81	.973
+FAMILY INVOLVEMENT	.278	.177	.319	.201
M13- CONTACT CAREGIVER	2.99	1.27	3.76	1.29
#TOTAL FAMILY HOURS	3.01	.859	3.24	.923
+FAMILY INVOLVEMENT	.278	.175	.264	.198
M14- ENHANCE STATUS	2.79	1.19	2.95	1.19
#TOTAL FAMILY HOURS	2.81	.874	2.83	.985
+FAMILY INVOLVEMENT	.290	.183	.312	.200

Key: S.D. = Standard Deviation
= Regular Data Transformation
+ = Scale Reversing Data Transformation

Table 9-2 - MANCOVA Results:
GROUPED MOTIVATIONS by
[Gender] with Family Demands

MOTIVATIONS	Hotelling's T^2	Approx. F	D.F.	α
JOB-RELATED				
Main Effects:				
Family Demands	.072	2.28	10,628	.013*
Gender (M/W)	.036	2.24	5,315	.051*
Interaction	.069	2.16	10,624	.019*
FAMILY-RELATED				
Main Effects:				
Family Demands	.029	2.38	4,650	.050*
Gender (M/W)	.080	12.98	2,326	.000*
Interaction	.016	1.34	4,646	.258
PERSONAL				
Main Effects:				
Family Demands	.029	1.70	6,712	.118
Gender (M/W)	.121	14.41	3,357	.000*
Interaction	.026	1.54	6,708	.161

Table 9-3 - ANCOVA Results:
NON-GROUPED MOTIVATIONS by
[Gender] with Family Demands

MOTIVATIONS	Approx. F	D.F.	α
M3 - ENCOURAGED BY BOSS			
Main Effects:			
Family Demands	6.34	2,317	.002*
Gender (M/W)	0.16	1,317	.690
Interaction	0.00	2,315	.999
M4 - ENCOURAGED BY SPOUSE			
Main Effects:			
Family Demands	1.83	2,281	.163
Gender (M/W)	0.20	2,281	.654
Interaction	0.81	2,279	.444
M13- CONTACT CAREGIVER			
Main Effects:			
Family Demands	14.82	2,244	.000*
Gender (M/W)	19.01	2,244	.000*
Interaction	0.22	2,242	.803
M14- ENHANCE STATUS			
Main Effects:			
Family Demands	0.08	2,369	.926
Gender (M/W)	1.72	2,369	.191
Interaction	1.46	2,367	.233

Table 9-4 - Multivariate Canonical Correlations Results:
Job and Family Motivations by Family Demands

MOTIVATIONS	Eigen- value	Canon. Corr.	% of Var.	Wilks L	Approx. F	D.F.	α
JOB-RELATED							
MEN	.0842	.2787	7.77	.9014	1.928	10,362	.040*
WOMEN	.1373	.3475	12.08	.8411	2.314	10,256	.013*
FAMILY-RELATED							
MEN	.0156	.1240	1.54	.9841	0.743	4,368	.564
WOMEN	.0847	.2795	7.81	.9175	3.056	4,278	.017*

Table 9-5 - Canonical Correlation Results:
Men's Job-Related Motivations by Family Demands

MOTIVATIONS	Correlations	Standardized Coefficients	Relevant or Redundant
+M1 - MORE JOB CONTROL	.49634	.47539	Relevant
M2 - FASTER TURNAROUND TIME	.43708	.60364	Relevant
M7- STAY IN TOUCH W. CLIENT	.05928	.23310	Redundant
M9- REARRANGE WORK SCHEDULE	.09320	.16815	Redundant
M10- REMAIN COMPETITIVE	-.62545	-.75261	Relevant
FAMILY DEMANDS			
TOTAL FAMILY HOURS	-.87994	-.92731	Relevant
+FAMILY INVOLVEMENT	-.38544	-.47744	Redundant

Key: + = Scale Reversing Data Transformation

Table 9-6 - Pearson Correlation Coefficients:
Men's Job-Related Motivations by Total Family Hours
UNTRANSFORMED VARIABLES

MOTIVATIONS	TOTAL FAMILY HOURS
M1 - MORE JOB CONTROL	.1457
M2 - FASTER TURNAROUND TIME	-.0796
M7 - STAY IN TOUCH W. CLIENT	-.0234
M9 - REARRANGE WORK SCHEDULE	.0055
M10- REMAIN COMPETITIVE	.0959

Table 9-7 - Canonical Correlation Results:
Women's Job-Related Motivations by Family Demands

MOTIVATIONS	Correlations	Standardized Coefficients	Relevant or Redundant
+M1 - MORE JOB CONTROL	-.92041	-.84123	Relevant
M2 - FASTER TURNAROUND TIME	.49467	.08774	Redundant
M7- STAY IN TOUCH W. CLIENT	.44681	.28906	Redundant
M9- REARRANGE WORK SCHEDULE	.52840	.32090	Redundant
M10- REMAIN COMPETITIVE	.26219	-.44394	Relevant
FAMILY DEMANDS			
TOTAL FAMILY HOURS	-.99995	-.99611	Relevant
+FAMILY INVOLVEMENT	.37227	.01057	Redundant

Key: + = Scale Reversing Data Transformation

Table 9-8 - Pearson Correlation Coefficients:
Women's Job-Related Motivations by Total Family Hours
UNTRANSFORMED VARIABLES

MOTIVATIONS	TOTAL FAMILY HOURS
M1 - MORE JOB CONTROL	-.3141
M2 - FASTER TURNAROUND TIME	-.1004
M7 - STAY IN TOUCH W. CLIENT	-.1683
M9 - REARRANGE WORK SCHEDULE	-.1642
M10- REMAIN COMPETITIVE	-.0683

Table 9-9 - Canonical Correlation Results:
Women's Family-Related Motivations by Family Demands

MOTIVATIONS	Correlations	Standardized Coefficients	Relevant or Redundant
M5 - BALANCE WORK AND HOME	.60879	.20122	Redundant
M12- MANAGE FAMILY LIFE	.98385	.89190	Relevant
FAMILY DEMANDS			
TOTAL FAMILY HOURS	.23223	-.11584	Redundant
+FAMILY INVOLVEMENT	-.99403	-1.03306	Relevant

Key: + = Scale Reversing Data Transformation

Table 9-10 - Pearson Correlation Coefficients:
Women's Family-Related Motivations by Family Involvement
UNTRANSFORMED VARIABLES

MOTIVATIONS	FAMILY INVOLVEMENT
M5 - BALANCE WORK AND HOME	.1934
M12- MANAGE FAMILY LIFE	.2961

Table 9-11 - Women's Multiple Regression Results:
M3 - Encouragement by Boss by Family Demands

VARIABLE	BETA	CORR.	PART COR.	R ²
TOTAL FAMILY HOURS	-.070061	-.038130	-.069134	.004780
+FAMILY INVOLVEMENT	-.196963	-.185605	-.194357	.037775

Key: + = Scale Reversing Data Transformation

Table 9-12 - Men's and Women's Multiple Regressions Results:
M13 - Contact Caregiver by Family Demands

VARIABLE	BETA	CORR.	PART COR.	R ²
MEN				
TOTAL FAMILY HOURS	.169604	.184044	.169269	.028652
+FAMILY INVOLVEMENT	-.229849	-.240504	-.229395	.052622
WOMEN				
TOTAL FAMILY HOURS	.110234	.230574	.102482	.010503
+FAMILY INVOLVEMENT	-.326686	-.367292	-.303713	.092242

Key: + = Scale Reversing Data Transformation

Question #10: Family Demands/Frequency of Use Interaction

Results

Question ten asked if family demands acted as a moderating variable in the relationships tested in the framework between frequency of cellular telephone use and the perceived consequences. Table 10-1 provides the unadjusted means and standard deviations for the 3X2 MANCOVA [Frequency of Use by Gender with Family Demands] for the grouped perceived consequences of perceived work productivity, time management, perceived control and stress, work-family conflict and job and life satisfaction and for the 3X2 ANCOVA for family satisfaction. Table 10-2 provides the multivariate results of the 3X2 MANCOVA and the 3X2 ANCOVA.

The main effects for family demands and gender were significant for all the perceived consequences and the main effect for frequency of use was significant for the grouped consequences. With one exception, there were no two-way or three-way significant interaction effects for either the grouped perceived consequences or family satisfaction. The interaction between family demands and frequency of use for the grouped consequences approached significance with an $\alpha = .056$. The univariate F tests for each of the perceived consequences for this interaction effect are presented in Table 10-3.

Follow-up analysis: family demands by frequency of use interaction.

According to the results in Table 10-3, both perceived work productivity (2) and work satisfaction showed univariate significance for the interaction between frequency of use and family demands. In other words, the effects of

family demands were not homogeneous across the three frequency of use groups for these two variables.

Normally, the procedure for examining an interaction effect would have been to graph the group means, but this was not possible since family demands were measured on two continuous scales. In order to obtain the necessary information for graphing purposes, separate simple regression equations had to be derived for each of the three frequency of use groups for both perceived work productivity (2) and work satisfaction. The family demands of total family hours and family involvement also had to be considered individually since looking at them together would have required graphing a multi-linear equation. Such an equation would have demanded a three dimensional plot and the application of this technique was beyond the scope of this thesis.

Tables 10-4, 10-5, 10-6 and 10-7 provide the results of the simple regressions for perceived work productivity and work satisfaction. Since the family involvement variable has been transformed, the original direction of its relationship with perceived work productivity and work satisfaction has to be reversed. The original Pearson Correlation Coefficients are also provided in the simple regression tables in order to facilitate interpretation of the results.

Interaction of family demands and frequency of use for perceived work productivity (2): The results of the simple regressions for total family hours (Table 10-4) and for family involvement (Table 10-5) showed that these variables accounted for less than five percent of the variance in perceived work productivity. Ten percent was considered to be the minimum amount necessary to ensure

that the regression was not capitalizing on chance (Tabachnick & Fidell, 1983). Therefore, the interaction between family demands and frequency of use for perceived work productivity was considered to be spurious.

Interaction of family demands and frequency of use for work satisfaction:

The results of the simple regressions for total family hours (Table 10-6) and family involvement (Table 10-7) showed that these variables accounted for less than five percent of the variance in work satisfaction. Therefore, given the explanation outlined above, the interaction between family demands and frequency of use for work satisfaction was considered to be spurious.

Discussion

The results indicated that family demands did have an impact on the perceived consequences experienced by the respondents. This concurs with the literature that shows that people with differing levels of family demands will experience varying degrees of such consequences as role overload and interference (Googins & Burden, 1987). This, in turn, can lead to increased stress and decreased family satisfaction. The findings also showed that men and women, as well as light, medium and heavy cellular users, experienced different levels of the perceived consequences.

The data indicated that family demands, in particular, did not cause cellular telephone users to experience varying degrees of the perceived consequences at different frequencies of cellular use. In other words, light, medium and heavy cellular users would still experience the same levels of perceived control, for example, no matter how high or low their respective family

demands were.

According to the literature, people with heavy family demands are more susceptible to role overload. They also experience more interference in those cases where family responsibilities interfere with the work domain (Bohen & Viveros-Long, 1981). This increase in role overload and interference has, in turn, been linked to negative consequences such as decreased time management, perceived work productivity and control, increased perceived stress and work-family conflict and, subsequently, decreased work, family and life satisfaction (Googins & Burden, 1987, Hall & Richter, 1988, Pleck, 1977, Kelly & Voydanoff, 1985). One of the premises of this research is that cellular telephones may act as mechanisms which allow people to cope more effectively with these demands. The lack of a significant relationship between increased family demands and a decreased ability to manage those demands suggests that people who make more frequent use of their cellular telephones are able to cope more effectively with their family responsibilities. In other words, they experience the same levels of time management, perceived work productivity, control and stress, work-family conflict and work, family and life satisfaction as individuals with lower family demands. This finding is backed up by the Motorola study (Gallup, 1991) which indicates that cellular users do have increased personal efficiency and productivity as a result of using the technology.

**Table 10-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender] With Family Demands**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
GROUPED												
PERCEIVED WORK PRODUCTIVITY (1)	3.71	.622	3.58	.601	3.92	.753	3.96	.776	4.15	.777	4.19	.588
PERCEIVED WORK PRODUCTIVITY (2)	3.16	.435	3.23	.412	3.27	.411	3.30	.510	3.40	.515	3.38	.474
TIME MANAGEMENT	3.04	.911	3.03	.905	2.82	.702	2.97	.725	2.74	.803	2.64	.904
PERCEIVED CONTROL	4.02	.714	4.04	.717	3.96	.741	4.33	.566	4.20	.540	4.24	.540
PERCEIVED STRESS	2.27	.699	2.23	.764	2.19	.657	2.19	.754	2.13	.689	2.37	.596
WORK-FAMILY CONFLICT	3.10	.808	3.16	.724	3.17	.708	3.22	.785	3.14	.829	3.39	.722
WORK SATISFACTION	3.96	.787	3.85	.891	3.74	.813	4.05	.800	3.87	.801	3.92	.729

Key: S.D. = Standard Deviation

**Table 10-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender] With Family Demands
(Continued)**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
GROUPED (Continued)												
LIFE SATISFACTION	3.39	.882	3.58	.909	3.38	.823	3.61	.924	3.38	.919	3.61	.980
#TOTAL FAMILY HOURS	2.76	.948	2.86	.979	2.89	.782	3.07	.956	2.85	.861	2.49	.864
+FAMILY INVOLVEMENT	.268	.186	.320	.213	.283	.177	.283	.192	.323	.181	.345	.198
NON-GROUPED												
+FAMILY SATISFACTION	1.30	.263	1.31	.304	1.34	.307	1.22	.318	1.38	.339	1.33	.283
#TOTAL FAMILY HOURS	2.81	.943	3.02	.991	2.93	.690	3.18	.970	2.92	.764	2.68	.985
+FAMILY INVOLVEMENT	.260	.192	.294	.219	.281	.176	.244	.187	.311	.175	.313	.193

Key: S.D. = Standard Deviation
 # = Regular Data Transformation
 + = Scale Reversing Data Transformation

Table 10-2 - MANCOVA/ANCOVA Results:
GROUPED AND NON-GROUPED PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender]
With Family Demands

PERCEIVED CONSEQUENCES	Hotelling's T ²	Approx. F	D.F.	α
GROUPED				
Main Effects:				
Family Demands	.091	2.15	16,762	.006*
Frequency of Use (L/M/H)	.152	3.61	16,758	.000*
Gender (M/W)	.065	3.10	8,380	.002*
Interactions:				
Family Demands/Frequency of Use/Gender	.081	0.93	32,1474	.580
Family Demands/Frequency of Use	.125	1.43	32,1474	.056*
Family Demands/Gender	.035	0.82	16,738	.669
Frequency of Use/Gender	.061	1.45	16,758	.111
FAMILY SATISFACTION				
Main Effects:			399	
Family Demands	----	83.48	2	.000*
Frequency of Use (L/M/H)	----	0.41	2	.662
Gender (M/W)	----	4.19	1	.041*
Interactions:			389	
Family Demands/Frequency of Use/Gender	----	1.81	4	.126
Family Demands/Frequency of Use	----	1.62	4	.167
Family Demands/Gender	----	1.46	2	.234
Frequency of Use/Gender	----	0.55	2	.579

Table 10-3 - Univariate Comparison:
GROUPED PERCEIVED CONSEQUENCES
Interaction of Frequency of Use and Family Demands

MOTIVATIONS	F	D.F.	α
PERCEIVED WORK PRODUCTIVITY (1)	1.35	4,377	.252
PERCEIVED WORK PRODUCTIVITY (2)	2.46	4,377	.047*
TIME MANAGEMENT	0.56	4,377	.690
PERCEIVED CONTROL	0.25	4,377	.910
PERCEIVED STRESS	0.63	4,377	.639
WORK-FAMILY CONFLICT	0.44	4,377	.779
WORK SATISFACTION	2.97	4,377	.020*
LIFE SATISFACTION	0.34	4,377	.854

Table 10-4 - Simple Regressions Results:
Perceived Work Productivity (2) by Total Family Hours
by Frequency of Use

GROUP	CONSTANT	B	CORR.	R ²
1	3.087	.0365	.0764	.0059
2	3.385	-.0369	-.0707	.0050
3	3.368	.0092	.0157	.0003

Table 10-5 - Simple Regressions Results:
Perceived Work Productivity (2) by Family Involvement
by Frequency of Use

GROUP	CONSTANT	B	CORR.	R ²	ORIGINAL CORR.*
1	3.211	-.0897	-.0396	.0016	.0592
2	3.265	.0496	.0195	.0004	-.0015
3	3.200	.5745	.2247	.0505	-.1643

* Original correlation before transformation

Table 10-6 - Simple Regressions Results:
Work Satisfaction by Total Family Hours
by Frequency of Use

GROUP	CONSTANT	B	CORR.	R ²
1	3.849	.0260	.0303	.0009
2	3.340	.1775	.1811	.0328
3	4.259	-.1411	-.1599	.0256

Table 10-7 - Simple Regressions Results:
Work Satisfaction by Family Involvement
by Frequency of Use

GROUP	CONSTANT	B	CORR.	R ²	ORIGINAL CORR.*
1	4.032	-.4968	-.1172	.0137	.1383
2	4.137	-.9525	-.2134	.0455	.2063
3	3.748	.4069	.1041	.0109	-.0973

* Original correlation before transformation

Hypotheses:

Relationship Between Perceived Consequences and Frequency of Use

Results

The hypotheses were that perceived work productivity, time management, perceived control, work satisfaction, family satisfaction and life satisfaction were positively associated with frequency of cellular telephone use and that perceived stress and work-family conflict were negatively associated with frequency of cellular telephone use.

One 3X2 MANCOVA and one 3X2 ANCOVA [Frequency of Use by Gender] with work and family demands as covariates, were run for the group of seven perceived consequences and for family satisfaction respectively. Table H-1 provides the unadjusted means and standard deviations for the 3X2 MANCOVA and the 3X2 ANCOVA. Table H-2 provides the multivariate results of the 3X2 MANCOVA and the univariate results of the 3X2 ANCOVA.

The main effects for work and family demands and frequency of use were significant for all the perceived consequences. The main effect of gender was significant for the grouped perceived consequences. There were no significant interaction effects for any of the analyses.

Follow-up analysis: hypotheses.

Given equal work and family demands, perceived productivity (1) and (2) seemed to be the only perceived consequences where there was a difference between the three frequency of use groups (Table H-3). In other words, given equal work and family demands, time management, perceived control perceived

stress, work-family conflict, job, family and life satisfaction were the same for light, medium and heavy cellular users.

The adjusted means of perceived work productivity (1) are graphed in Figure 15. The first measure was chosen because the mean differences were more pronounced and it provided a clearer picture of the relationships between the three frequency of use groups.

According to Figure 15, there were pronounced differences between the three frequency of use groups. There was almost a perfectly linear relationship between perceived work productivity and frequency of cellular telephone use. Beginning with light users at the bottom of the graph, perceived work productivity was on an increasing curve through medium users and was highest for heavy users.

Overall, there was a positive relationship between frequency of use and perceived work productivity, therefore, the hypothesis that perceived work productivity was positively associated with frequency of cellular telephone use was accepted.

Discussion

When the effects of work and family demand were removed, frequency of cellular telephone use did not seem to have an impact on time management, perceived control or stress, work-family conflict or job, family or life satisfaction. In other words, varying the degree of cellular telephone use did not appear to either increase or decrease the levels of these perceived consequences.

What these results seemed to show is that heavier users may have been coping with their work and family demands as well as lighter users due to the technology's ability to provide them with increased time and location flexibility. In other words, the cellular telephone may enable heavy users to manage their demands to the extent that they have the same levels of the consequences examined in this study as the light users.

The effects of frequency of use were strong enough, however, to have a solitary impact on perceived work productivity. The results clearly showed that even after the effects of work and family demands were removed, perceived work productivity still increased with increasing levels of cellular telephone use. This finding was validated by the Motorola (Gallup, 1991), Nynex (Yankelovich et al, 1991) and AT&T (Zey, 1988) studies that all reported improved work productivity to be a major benefit of cellular telephone use. The results suggest that heavy users may perceive that their work productivity is increasing simply by virtue of the fact that they spend so much time on their cellular telephones. In other words, heavy users surmise that their work productivity has increased since their cellular telephones enable them to perform work tasks during daily periods that they would otherwise consider to be wasted, or idle, time (i.e. daily commute to and from work; time spent in traffic jams; travelling to and from appointments, etc.).

**Table H-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender]
With {Work and Family Demands}**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
GROUPED												
PERCEIVED WORK PRODUCTIVITY (1)	3.71	.622	3.57	.604	3.92	.753	3.96	.776	4.15	.777	4.19	.588
PERCEIVED WORK PRODUCTIVITY (2)	3.16	.435	3.23	.414	3.27	.441	3.30	.510	3.40	.515	3.38	.474
TIME MANAGEMENT	3.04	.911	3.02	.905	2.82	.702	2.97	.725	2.74	.803	2.64	.904
PERCEIVED CONTROL	4.02	.714	4.05	.719	3.96	.741	4.33	.566	4.20	.540	4.24	.700
PERCEIVED STRESS	2.27	.699	2.22	.764	2.19	.657	2.19	.754	2.13	.689	2.37	.596
WORK-FAMILY CONFLICT	3.10	.808	3.15	.726	3.17	.708	3.22	.785	3.14	.829	3.39	.722

Key: S.D. = Standard Deviation

**Table H-1 – Means and Standard Deviations:
PERCEIVED CONSEQUENCES BY
[Frequency of Use by Gender]
With {Work and Family Demands}
(Continued)**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
GROUPED (Continued)												
WORK SATISFACTION	3.96	.787	3.86	.894	3.74	.813	4.05	.800	3.87	.801	3.92	.729
LIFE SATISFACTION	3.39	.882	3.58	.916	3.38	.823	3.61	.924	3.38	.919	3.61	.980
TOTAL WORK HOURS	11.24	3.84	10.36	3.46	12.07	4.46	10.84	3.35	11.57	3.00	12.29	3.84
#TOTAL FAMILY HOURS	2.76	.948	2.90	.923	2.89	.782	3.07	.956	2.85	.861	2.49	.864
WORK INVOLVEMENT	3.19	.954	3.16	.939	3.20	.915	3.32	.932	3.47	.946	3.21	.931
+FAMILY INVOLVEMENT	.268	.186	.317	.214	.283	.177	.283	.192	.323	.181	.345	.198

Key: S.D. = Standard Deviation
 # = Regular Data Transformation
 + = Scale Reversing Data Transformation

**Table H-1 - Means and Standard Deviations:
PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender]
With [Work and Family Demands]
(Continued)**

	LIGHT USERS				MEDIUM USERS				HEAVY USERS			
	MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
NON-GROUPED												
+FAMILY SATISFACTION	1.31	.262	1.32	.304	1.34	.306	1.22	.318	1.38	.339	1.33	.286
TOTAL WORK HOURS	10.99	3.84	10.28	3.40	11.82	3.94	10.57	3.10	11.39	2.49	12.50	3.89
#TOTAL FAMILY HOURS	2.81	.950	3.08	.925	2.94	.689	3.18	.970	2.92	.764	2.61	.901
WORK INVOLVEMENT	3.20	.977	3.12	.955	3.20	.919	3.38	.975	3.47	.974	3.19	.939
+FAMILY INVOLVEMENT	.265	.191	.297	.221	.285	.174	.244	.187	.311	.175	.321	.189

Key: S.D. = Standard Deviation

= Regular Data Transformation

+ = Scale Reversing Data Transformation

Table H-2 - MANCOVA/ANCOVA Results:
GROUPED AND NON-GROUPED PERCEIVED CONSEQUENCES
[Frequency of Use by Gender]
With {Work and Family Demands}

PERCEIVED CONSEQUENCES	Hotelling's T^2	Approx. F	D.F.	α
GROUPED				
Main Effects:				
Work and Family Demands	.500	5.86	32,1502	.000*
Frequency of Use (L/M/H)	.137	3.14	16,752	.000*
Gender (M/W)	.065	3.09	8,377	.002*
Interactions:				
Demands/Frequency of Use /Gender	.148	0.82	64,2842	.845
Frequency of Use/Gender	.059	1.38	16,752	.144
FAMILY SATISFACTION				
Main Effects:			389	
Work and Family Demands	----	39.39	4	.000*
Frequency of Use (L/M/H)	----	0.31	2	.732
Gender (M/W)	----	4.08	1	.044*
Interactions:				
Demands/Frequency of Use /Gender	----	0.96	369 8	.223
Frequency of Use/Gender	----	0.44	2	.518

Table H-3 - Univariate Comparison:
GROUPED PERCEIVED CONSEQUENCES by
[Frequency of Use by Gender]
With {Work and Family Demands}

MOTIVATIONS	F	D.F.	α
PERCEIVED WORK PRODUCTIVITY (1)	17.56	2,384	.000*
PERCEIVED WORK PRODUCTIVITY (2)	6.15	2,384	.002*
TIME MANAGEMENT	2.49	2,384	.084
PERCEIVED CONTROL	1.86	2,384	.157
PERCEIVED STRESS	0.32	2,384	.726
WORK-FAMILY CONFLICT	0.26	2,384	.775
WORK SATISFACTION	0.00	2,384	.999
LIFE SATISFACTION	0.07	2,384	.333

Figure 15 - Graph of Adjusted Group Means for Perceived Work Productivity

Conclusions

The goals of this research were to determine why cellular telephone users adopted the technology and what impact it has had on their ability to balance work and family demands. The first part of the conclusions discusses the reasons for using a cellular telephone and the second part examines the effect that the technology has had on people's lives. The section ends with a discussion of the strengths and weaknesses of the study and some suggestions for future research.

Why do cellular telephone users adopt this technology? The research examined three areas where people could use a cellular telephone to improve the quality of their lives: the organizational, individual and family domains. It also looked at whether the motivations for cellular telephone use in each domain were being influenced by various factors, including how often the individual needed to use the telephone (frequency of use), gender, parental status and the levels of work and family demands.

The primary reasons for cellular telephone use appear to be work related including the desire to maintain, or increase, the amount of control users have over their work domains. Other important motivations include the desire to improve work efficiency and effectiveness and to increase competitiveness. This confirms what little is already known concerning cellular user's motivations (Gallup, 1991, Yankelovich et al, 1991, Zey, 1988).

This study also found that the harder people worked, the more they relied on their cellular telephones. Heavy users of the technology (who were also those

with the highest level of work demands) were the most appreciative concerning the work-related benefits of cellular telephone use. It is difficult to determine, however, whether these users employ the technology to maintain control over their work domains or to enable them to continually augment their ability to handle new business and responsibilities (i.e. do they use their phones to help with expansion or just to maintain their current heavy workloads at a manageable level). Heavy users were also less likely to appreciate the ability to be reached at all times via their cellular telephones. This suggests, given their heavier workloads, that they might sometimes reach a point where having a cellular telephone is more of an intrusion than an advantage.

Gender differences showed that, overall, women outranked men in the importance they place on using a cellular telephone for managing both work and family responsibilities. A more in-depth analysis revealed that the more involved women were with their families, the more likely they were to use their cellular telephones for family management and the less likely they were to use them to manage their work domains. A review of the established literature concerning men's and women's family roles helps to explain the reasons for this particular finding. According to Googins and Burden (1987), women tend to be responsible for a disproportionate share of family responsibilities, including household management and child care. This is often the result of common socio-cultural expectations concerning a woman's family role. In addition, Hall and Richter (1988) indicate that working women are often expected to fulfill their work and family responsibilities simultaneously (i.e. at the same time). This often leads to

role overload and interference (Bohen & Viveros-Long, 1981) which is the case where tasks from one domain interfere with the execution of duties in the other domain (i.e. work interferes with family or vice versa). Evidence of this can be found in the fact that significantly more women than men use their cellular telephones for personal calls. Given that women with families are most likely in need of tools to help them cope with their overwhelming number of family responsibilities, it is not surprising to discover that they prefer to use their cellular telephones as aids for family management. This, of course, should not override the finding that women also valued their telephones for helping them exert more control over their work domains.

Family-oriented women also valued their cellular telephones as tools for increasing their competitiveness. This finding may be a reflection of the women's need for assistance (given their heavier family responsibilities) so that they may compete with men on the same level. Women who were less family-oriented were more likely to view their phones as work tools. This is most likely an indication of the fact that, in recent years some women have begun to place more emphasis on career building, and have either put-off having families or decided not to have children at all. These women are competing with men for career positions and are aware of the need for any technology that helps provide them with a competitive advantage.

Men, on the other hand, used their cellular telephones to exert more job control and to minimize disruptions to their families. In other words, they were able to use their phones to help them get ahead at work and still maintain their

level of family involvement, unlike the women whose family involvement decreased the more they emphasized job-related reasons for using a cellular telephone. The literature suggests that men are able to do this because their work and family demands are sequential in nature (i.e. work and family tend not to interfere with each other as they do in the women's case) (Hall & Richter, 1988). Therefore, men can deal with job-related problems at work and with family-related problems while away from work. Having a cellular telephone simply assists them in augmenting and maintaining this pattern of behaviour.

Safety and security were important for both men and women. This finding was not surprising given that ninety percent of the survey respondents used their phones during their daily commutes to work. Vehicle breakdowns or accidents are troublesome and potentially life threatening and having a cellular telephone on hand helps to ease the fear of being unable to reach help in a hurry. It was also not surprising to discover that significantly more women than men saw safety and security as important reasons for having a cellular telephone. It is a well known fact that women are often the victims of violent crime in our society. Having the ability to summon help undoubtedly goes a long way towards relieving the fear that many women have of travelling alone.

It was difficult to reach a conclusion on whether parental status had any influence on the respondents' reasons for choosing to use cellular telephones. The statistical results appeared to contradict the established literature in that being a parent (especially a female parent) did not increase the importance the respondents placed on using a cellular telephone to manage either the family or

work domains. It is felt that these results might be a reflection of the sample demographics. Thirty-six percent of the children reported by the respondents were over the age of nineteen. It is possible that these children are no longer living at home and that their parents do not have the same demands placed on them as parents of younger children. In other words, the parents of the older children may behave in ways more similar to non-parents than to the other parents in the sample. This may have blurred the impact of parental status to the point that a significant effect could not be achieved.

One finding was clear, however. Female parents were far more likely than male parents to use their cellular telephones to contact their child's school or caregiver during the work day. This is further evidence of the fact that the onus for family responsibilities is more on women than men.

Finally, motivations for cellular telephone use appeared to be internally generated. In other words, men and women did not appear to be influenced by the wishes of either their spouses, bosses, colleagues or friends when it came to choosing to adopt the technology. The only exception to this was in the case of heavy users who indicated that they were encouraged by their bosses to use cellular telephones.

Overall, then, women were more likely than men to use their cellular telephones to exert greater control over their organizational, family and individual domains. The next section examines whether this increased control resulted in an improved ability to balance work and family role demands for the respondents of this survey.

According to Karasek's (1979) job-strain model, individuals who have little control over their work environments often experience negative consequences such as poor work productivity, increased perceived stress and decreased work satisfaction. Other literature indicates that workers who have work time and location flexibility are better able to manage their work and family role demands because they have an increased ability to control, predict and absorb change (Pleck et al., 1980, Rothman & Marks, 1987, Helsing, 1988, Olson & Primp, 1984).

This research is partly based on the premise that cellular telephones act as tools which provide individuals with the flexibility they need in order to better manage and control their work and family domains. This increase in control should help them to increase their perceived work productivity and time management and reduce their perceived stress and overall work-family conflict. As a result, frequent users of cellular telephones should experience higher levels of work, family and life satisfaction.

A review of the first section on motivations indicates that people are using their phones to manage and control their organizational, family and individual domains. In other words, cellular telephones are being used to help balance work and family demands. But, has this resulted in a minimization of the negative effects of the consequences mentioned above?

The results showed that there were basic gender differences concerning the ability to balance work and family demands. At different frequencies of cellular telephone use, men and women experienced varying levels of perceived control

and work satisfaction. Women had increasing levels of these two consequences the more they used their phones but, after a certain point, increased use became associated with decreased perceived control and work satisfaction. This could be an indication that there is a point of diminishing returns for women where the benefits of cellular telephone use are outweighed by the drawbacks. For example, the demographics of the sample showed that more women than men were employed in sales positions. If these jobs require a lot of travelling, a cellular telephone could increase perceived control by alleviating the communication problem. But, after a certain point, the phone might become more intrusive than helpful and the user might experience a loss of control over the work environment.

Men, on the other hand, showed stable levels of perceived control and decreasing levels of work satisfaction coupled with increased frequency of cellular telephone use. This direction changed, however, as frequency of use became much heavier and perceived control and work satisfaction began to increase. This pattern was the opposite of the one displayed by the women. Demographic data showed that the male respondents were in a different occupational situation than the female respondents (i.e. more of them either owned their own companies or were employed as top level executives). These positions are generally associated with high level decision making which necessitates constant communication with the organization in order to stay on top of management situations. The results suggest that, as frequency of use increases, the men's levels of perceived control and work satisfaction will also increase commensurate with

the need for continual contact with the organization.

There were no gender differences between light, medium and heavy users concerning the organizational consequence of perceived work productivity or the family (work-family conflict, family satisfaction) and individual (time management, perceived stress, life satisfaction) consequences. This suggests that, even with the women's traditionally heavier family demands, they have the same ability as the men to balance their work and family roles. This is further evidence that the cellular telephone is acting as a coping mechanism by augmenting the women's control over their work and family domains and is helping to put them on an equal level with the men.

The established literature (Kelly & Voydanoff, 1985) suggests that parents are more likely than non-parents to suffer from role overload and interference given their heavier family demands. This was not the case in this study, however, as having children did not alter the ability of light, medium or heavy users to cope equally well with their work and family demands. Again, as with the motivations, it was difficult to draw conclusions concerning the impact of parental status given the sample demographics. The results may suggest that the cellular telephone is helping parents cope with family responsibilities to the point where they have the same capability as non-parents to balance their work and family demands, but this is a tenuous conclusion.

The survey respondents' abilities to balance their work and family demands varied depending on how heavy those demands were. However, when considered in the context of frequency of cellular telephone use, varying work

and family demands did not appear to effect any differences between light, medium and heavy users. This was observed even though work demands increased with frequency of use (see Appendix 7). This is not an unusual finding given the fact that all the results of this and other research (Gallup, 1991, Yankelovich et al, 1991, Zey, 1988) point to the conclusion that cellular telephones are capable of helping users to better cope with the demands of their work and family roles. These results again suggest that use of a cellular telephone enables people to more effectively cope with their work and family demands. This, in turn, provides them with enhanced abilities to balance the work and family domains.

Overall, then, the primary benefits of cellular telephone use seem to be related to the organizational environment. Users appreciate the enhanced control they can exert over their work domains as well as the opportunity for improved work efficiency and effectiveness which helps them to strengthen their competitive position. In addition, women, who have traditionally been overburdened by their larger share of family responsibilities appear to appreciate the opportunities provided by cellular telephone use to better manage their family domains and still maintain an equal footing with their male colleagues at work. In some cases, women without families may be using their phones to more effectively compete with their male counterparts and further their chances for career advancement.

Light medium and heavy cellular users, be they men or women, parents or non-parents, or people with high or low work or family demands, all seem to be on the same level concerning their ability to balance work and family

demands. The only discrepancy is between men and women pertaining to their perceived control and work satisfaction and this can most likely be explained by the different occupations both genders have in the samples. These findings strongly suggest that the time and location flexibility provided by the cellular telephone allows the users to exert more control over their individual, organizational and family domains. This has most likely helped them to minimize the negative consequences of work and family role demands to such a degree that light, medium and heavy cellular telephone users are virtually indistinguishable from each other.

There were a number of benefits and limitations of this research. The first benefit concerns the exploratory nature of this study. The empirical data that has been collected during the course of the research will be available to assist future researchers in furthering this area and developing new theories.

Second, all but two of the survey measures were from the established literature which has strengthened the validity of the findings. Third, the use of a stratified random sample resulted in the over-representation of women in the database. This approach allowed for a detailed analysis by sex. The gender aspect of cellular telephone use has never been studied before.

The first weakness is that the results may be limited in their applicability over time. As the cost of the technology decreases it is becoming more accessible to the general public. Hence the profile of an average user is changing. An analysis performed on the current sample of users may or may not be applicable in the next few years.

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Second, the study was designed to control for the length of cellular subscribership. It was believed that limiting the sample to respondents who have had cellular telephones from six months to a year and a half would allow for a more rigorous analysis of the data. This might not, however, allow the results to be applied to users who have had their cellular telephones for a longer period of time.

Third, the population of cellular telephone users from which the sample was drawn was restricted to those subscribing to Cantel's network. It should be noted that this only comprises 51% of the Canadian cellular network market. For this reason, the generalizability of the results may be limited.

Fourth, while the analysis controlled for work and family demands, it was difficult to take all potential moderating variables into account, such as a respondent's occupation, which might have interfered with the statistical analyses.

Finally, it should be noted that the findings of this research were based on a sample which was comprised of approximately seventeen percent ($N = 525$) of the 3,160 cellular telephone subscribers who were surveyed. It is possible that these respondents do not reflect the attitudes and lifestyles of the entire sample. This is an unfortunate but generally acceptable drawback to survey research.

Given the dearth of literature concerning the impact of cellular telephones, it was difficult to formulate a research framework which could take all the aspects of the technology into account. With the explosive growth and penetration of cellular telephones in our society, it is hoped that more research will be undertaken in the future. It would be useful to further examine the

differences between men and women, particularly in the case where men may assume more of an equal share of the family responsibilities. More study is also needed concerning parents and the impact cellular telephones have had on their abilities to manage their work and family roles. Future studies should, however, attempt to obtain a more homogeneous sample of parents (i.e. parents with young children) so that the impacts of parental status and family demands at different stages of the family life cycle can be examined (i.e. children in daycare, children in elementary school, etc.). Finally, the impact of cellular telephones can be better understood if future research includes a larger proportion of heavy and very heavy users. A closer examination of the users who have the most contact with the technology will more clearly outline its advantages and disadvantages for society.

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APPENDIX 1 - SURVEY COVER LETTER

Dear Cantel Subscriber,

The cellular telephone is rapidly becoming an integral part of everyday life. While the use of cellular telephones is one of the fastest growing segments of the telecommunications industry, so far little attention has been paid to the technology's impact on the user. Cantel and The School of Business at Carleton University (Ottawa, Ontario) have joined together to conduct a nation-wide study of cellular telephone users which we believe will shed some light in this area.

In order for us to examine the impact of cellular telephones, we need to know something about the users. In the enclosed survey you will find questions which cover a wide range of areas, including your work life; your family life; how you manage your time; the amount of stress you experience; your reasons for acquiring a cellular telephone; and how you use your cellular telephone.

This questionnaire will take approximately 15-20 minutes to complete. Please be assured that all of your responses will be held in the **STRICTEST CONFIDENCE**. While some of the questions are of a personal nature, the survey has been designed so that it is impossible for us to identify those individuals who respond. We have also arranged for all the questionnaires to be returned to Visimar which is an independent data tabulation company. When you finish the questionnaire, please mail it back to Visimar in the pre-addressed, postage-paid envelope included in your package.

The final results of this research will be used by Mr. Robert Tannenbaum as part of his graduate work in pursuit of the degree of Master of Management Studies, School of Business, Carleton University.

Thank you very much for your cooperation. If you have any questions, please contact Robert Tannenbaum at the telephone number provided below.

Sincerely,

Ellen Maidman
Vice President, Marketing
National Cellular Group
Cantel
(416) 250-3882

Professor Linda Duxbury
School of Business
Carleton University
(613) 788-2385

Robert Tannenbaum,
Masters Candidate
Voice and Fax:
(613) 526-2959

APPENDIX 2 - QUESTIONNAIRE

CANTEL-CARLETON UNIVERSITY CELLULAR USERS SURVEY

There are several different types of questions throughout this questionnaire which will require you to either:

- Check off a box;
- Write in some information; or
- Circle a number on a scale between 1 and 5.

Please read the box of instructions at the beginning of each section so that you will know how to answer every question. Any questions concerning your spouse can be answered in terms of the person you currently live with.

Thank you very much for your cooperation.

**PLEASE BE ASSURED THAT YOUR RESPONSES
WILL BE HELD IN CONFIDENCE**

SECTION A: USE OF A CELLULAR TELEPHONE

THE FIRST SET OF QUESTIONS RELATES TO THE USE OF YOUR CELLULAR TELEPHONE IN AN AVERAGE WEEK AND HOW THIS HAS AFFECTED YOUR JOB. PLEASE CHECK, CIRCLE OR WRITE IN THE MOST APPROPRIATE ANSWER FOR EACH QUESTION.

- 1) Do you ever use your cellular telephone on your way to and/or from work?

Yes ☐
No ☐
I work out of my home ☐

- 2) Do you ever use your cellular telephone for work-related purposes?

Yes ☐
No ☐ ----> skip to Question 4

- 3) Please indicate how much the following aspects of your work life have changed since you started using a cellular telephone.

	DECREASED A LOT	DECREASED A LITTLE	STAYED THE SAME	INCREASED A LITTLE	INCREASED A LOT
Your average daily output at work.	1	2	3	4	5
The number of hours you work at your job.	1	2	3	4	5

Your overall work productivity.	1	2	3	4	5
Your stress level.	1	2	3	4	5

4) How many calls do you make and receive in an **average week**?

TOTAL _____ calls MADE and RECEIVED per week

5) Please record the percentage of time in which you use your cellular telephone for the following purposes:

a) Business Calls _____%
vs.
Personal Calls _____%
Must add to 100%

b) Make Calls _____%
vs.
Receive Calls _____%
Must add to 100%

SECTION B: REASONS FOR USING A CELLULAR TELEPHONE

THE NEXT TWO QUESTIONS DEAL WITH YOUR REASONS FOR USING A CELLULAR TELEPHONE AND YOUR LEVEL OF SATISFACTION WITH CANTEL'S SERVICE. PLEASE CIRCLE OR CHECK THE MOST APPROPRIATE ANSWER FOR EACH QUESTION.

6) Please indicate the extent to which you agree or disagree with each of the following statements.

STRONGLY DISAGREE	SOMEWHAT DISAGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT AGREE	STRONGLY AGREE	DOES NOT APPLY
----------------------	----------------------	----------------------------------	-------------------	-------------------	----------------------

I use a cellular telephone because:

It gives me more control over when and where I do my job.	1	2	3	4	5	N/A
---	---	---	---	---	---	-----

It gives me a faster turnaround time on my work.	1	2	3	4	5	N/A
--	---	---	---	---	---	-----

I am encouraged by my boss and/or colleagues to use the cellular telephone to improve the performance of my job.	1	2	3	4	5	N/A
--	---	---	---	---	---	-----

I am encouraged by my spouse to use the cellular telephone so I can avoid overtime at the office.

1 2 3 4 5 N/A

It helps me balance the conflicting demands of work and home.

1 2 3 4 5 N/A

Having the phone with me gives me a feeling of safety and security.

1 2 3 4 5 N/A

It allows me to stay in touch with my clients.

1 2 3 4 5 N/A

It allows people to reach me wherever I happen to be.

1 2 3 4 5 N/A

I can rearrange my work schedule in the event of last minute changes.

1 2 3 4 5 N/A

It helps me to remain competitive with others in my industry.

1 2 3 4 5 N/A

It helps me in scheduling my free time (e.g. dates, friends).

1 2 3 4 5 N/A

It helps me to manage my family life.

1 2 3 4 5 N/A

I can keep in contact with my children's school or daycare/ babysitter during the day.

1 2 3 4 5 N/A

I feel that it enhances my status among my colleagues and friends.

1 2 3 4 5 N/A

7) Overall, in terms of your total experience to date, how would you rate Cantel's service?

Excellent []
Good []
Fair []
Poor []

SECTION C: TIME MANAGEMENT

THE FOLLOWING QUESTIONS RELATE TO HOW YOU SPEND YOUR TIME AND DIVIDE RESPONSIBILITIES. PLEASE WRITE IN OR CIRCLE THE MOST APPROPRIATE ANSWER FOR EACH QUESTION.

- 8) On an average work day approximately how much time do you spend in the following activities:

Working at your job	1	_____ HOURS
Home chores and errands		_____ HOURS
Activities with children	1	_____ HOURS
Discussing work-related matters on your cellular telephone		_____ MINUTES
Discussing family/personal matters on your cellular telephone		_____ MINUTES

- 9) On an average day off, approximately how much time do you spend in the following activities:

Working at your job	_____ HOURS
Home chores and errands	_____ HOURS
Activities with children	_____ HOURS
Discussing work-related matters on your cellular telephone	_____ MINUTES
Discussing family/personal matters on your cellular telephone	_____ MINUTES

- 10) How easy or difficult is it for you to find time to:

	VERY DIFFICULT	SOMEWHAT DIFFICULT	NEITHER EASY NOR DIFFICULT	SOMEWHAT EASY	VERY EASY	DOES NOT APPLY
Spend time by yourself?	1	2	3	4	5	N/A
Go to doctor or dentist appointments?	1	2	3	4	5	N/A
Go on errands (e.g., shoe repair, post office, car service)?	1	2	3	4	5	N/A

Go shopping (e.g. groceries, drugstore)?	1	2	3	4	5	N/A
Be home for services/deliveries (e.g., telephone, appliances)?	1	2	3	4	5	N/A
Spend fun/educational time with family?	1	2	3	4	5	N/A
Make telephone calls for appointments or services?	1	2	3	4	5	N/A
Have meals with your family?	1	2	3	4	5	N/A
Have relaxed, pleasant times with your children?	1	2	3	4	5	N/A
Be home when your children get home from school?	1	2	3	4	5	N/A
Take your children to doctor or dentist appointments?	1	2	3	4	5	N/A
Stay home with a sick child?	1	2	3	4	5	N/A
Take your children to or from daycare or school?	1	2	3	4	5	N/A
Go to school events for your children?	1	2	3	4	5	N/A
Make arrangements for children during school breaks?	1	2	3	4	5	N/A

SECTION D: THE WORK YOU DO

THE FOLLOWING QUESTIONS ASK ABOUT THE WORK YOU DO. PLEASE CIRCLE THE MOST APPROPRIATE ANSWER FOR EACH QUESTION.

11) Please indicate how satisfied or dissatisfied you are with:

	VERY DISSATISFIED	SOMEWHAT DISSATISFIED	NEUTRAL	SOMEWHAT SATISFIED	VERY SATISFIED
Your job in general.	1	2	3	4	5
Your income.	1	2	3	4	5
The number of hours you work.	1	2	3	4	5

The schedule of your working hours.	1	2	3	4	5
The sorts of things you do on the job.	1	2	3	4	5

12) How much do you agree or disagree with the following statements:

	STRONGLY DISAGREE	SOMEWHAT DISAGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT AGREE	STRONGLY AGREE
What I do at work is more important to me than the money I earn.	1	2	3	4	5
I would be happy if I didn't have to work at all.	1	2	3	4	5
My main interest in work is to get enough money to do the other things I want to do.	1	2	3	4	5

SECTION E: WORK AND FAMILY

THE FOLLOWING SECTION ASKS ABOUT THE WAYS IN WHICH YOUR WORK AND FAMILY LIFE INTERACT. PLEASE CIRCLE THE MOST APPROPRIATE ANSWER FOR EACH STATEMENT.

13) Please indicate the extent to which you agree or disagree with each of the following statements:

	STRONGLY DISAGREE	SOMEWHAT DISAGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT AGREE	STRONGLY AGREE	DOES NOT APPLY
I feel I have more to do than I can comfortably handle.	1	2	3	4	5	N/A
I feel physically drained when I get home from work.	1	2	3	4	5	N/A
I feel emotionally drained when I get home from work.	1	2	3	4	5	N/A
I feel I have to rush to get everything done each day.	1	2	3	4	5	N/A
I feel I don't have enough time for myself.	1	2	3	4	5	N/A

My job keeps me away from my family too much.	1	2	3	4	5	N/A
I have a good balance between my job and my family time.	1	2	3	4	5	N/A
I wish I had more time to do things for my family.	1	2	3	4	5	N/A
My time off work does not match other family members' schedules	1	2	3	4	5	N/A
I always find enough time for the children.	1	2	3	4	5	N/A

SECTION F: FAMILY

THE FOLLOWING QUESTION ASKS ABOUT YOUR FAMILY. PLEASE CIRCLE THE MOST APPROPRIATE ANSWER FOR EACH STATEMENT.

14) To what extent do you agree or disagree with the following:

	STRONGLY DISAGREE	SOMEWHAT DISAGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT AGREE	STRONGLY AGREE	DOES NOT APPLY
A great satisfaction in my life comes from my role as a parent.	1	2	3	4	5	N/A
A great satisfaction in my life comes from my role as a spouse.	1	2	3	4	5	N/A
I am very much involved personally with my family members' lives.	1	2	3	4	5	N/A
The most important things that happen to me are related to my family roles.	1	2	3	4	5	N/A

SECTION G: STRESS AND CONTROL

THE FOLLOWING SET OF QUESTIONS ASKS ABOUT STRESS, CONTROL AND HOW YOU FEEL ABOUT YOUR LIFE IN GENERAL. PLEASE CIRCLE THE MOST APPROPRIATE ANSWER FOR EACH QUESTION.

15) How often in the last month have you:

	NEVER	ALMOST NEVER	SOME- TIMES	FAIRLY OFTEN	VERY OFTEN
Felt that you were unable to control important things in your life?	1	2	3	4	5
Felt confident about your ability to handle your personal problems?	1	2	3	4	5
Felt that things were going your way?	1	2	3	4	5
Felt difficulties were piling up so high that you could not overcome them?	1	2	3	4	5

16) To what extent do you agree or disagree with the following statements?

	STRONGLY DISAGREE	SOMEWHAT DISAGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT AGREE	STRONGLY AGREE
There is really no way I can solve some of the problems I have.	1	2	3	4	5
Sometimes I feel that I am being pushed around in life.	1	2	3	4	5
I have little control over the things that happen to me.	1	2	3	4	5
I can do just about anything I really set my mind to.	1	2	3	4	5
I often feel helpless in dealing with the problems of life.	1	2	3	4	5
There is little I can do to change many of the important things in my life.	1	2	3	4	5
What happens to me in the future depends mostly on me.	1	2	3	4	5

In most ways my life is close to ideal.	1	2	3	4	5
The conditions of my life are excellent.	1	2	3	4	5
I am satisfied with my life.	1	2	3	4	5
So far I have gotten the important things out of my life.	1	2	3	4	5
If I could live my life over, I would change almost nothing.	1	2	3	4	5

SECTION H: DEMOGRAPHICS

WE NEED SOME DEMOGRAPHIC INFORMATION ABOUT YOU TO HELP US INTERPRET THIS QUESTIONNAIRE. THIS INFORMATION IS ONLY USED TO PROVIDE AN OVERALL PROFILE OF ALL RESPONDENTS - IT IS NOT ANALYZED SEPARATELY FOR EACH INDIVIDUAL. PLEASE CHECK OR WRITE IN YOUR ANSWERS TO THESE QUESTIONS.

- 17) What type of cellular phone unit(s) do you have? Please write in the number of phones you have of each type listed below.

Fixed cellular phone installed in your car: _____ PHONE(S)

Fully portable phone: _____ PHONE(S)

Other (please specify: _____) _____ PHONE(S)

- 18) How many months has it been since you first began your Cotel Cellular telephone service?

_____ MONTHS

- 19) Who was responsible for the purchase or lease of your cellular telephone?

You personally []
 The company you own []
 The company you work for []
 Your spouse []

- 20) What is your sex?

Male []
 Female []

21) What is your present marital status?

Married or living with someone	[]
Divorced	[]
Separated	[]
Never married	[]
Widowed	[]

22) Does your spouse ever use your cellular telephone?

Yes	[]
No	[]
No spouse	[]

23) Please circle your age category and your spouse's age category.

YOUR AGE

YOUR SPOUSE'S AGE

18 - 24	[]	No spouse	[]
25 - 34	[]	18 - 24	[]
35 - 44	[]	25 - 34	[]
45 - 54	[]	35 - 44	[]
55 - 64	[]	45 - 54	[]
65 or older	[]	55 - 64	[]
		65 or older	[]

24) How many children do you have between the ages of (if no children, skip to Q27):

5 AND YOUNGER:	_____
6 TO 12:	_____
13 TO 18:	_____
19 AND OVER:	_____

25) Do any of your children require child care while you are at work?

Yes	[]
No	[]

26) In your family, who has the main responsibility for the day to day arrangements for the care of the children?

I HAVE	SHARE EQUALLY WITH SPOUSE	SPOUSE HAS		
1	2	3	4	5

27) What was the last level of schooling you completed? Your spouse completed?

YOU

Public school []
High school []
Technical/Trade school []
College/CEGEP []
University - Undergraduate []
University - Graduate []

YOUR SPOUSE

No spouse []
Public school []
High school []
Technical/Trade school []
College/CEGEP []
University - Undergraduate []
University - Graduate []

28) Do you own your own company? What about your spouse?

YOU

Yes []
No []

YOUR SPOUSE

No spouse []
Yes []
No []

29) Are you a member of a certified profession (e.g. doctor, lawyer, accountant, etc.)?
What about your spouse?

YOU

Yes []
No []

YOUR SPOUSE

No spouse []
Yes []
No []

30) Please check the box which best fits your occupational title and your spouse's occupational title:

YOU

Owner/
President/Partner []
Vice President []
Manager []
Technical []
Sales []
Administrative []
Clerical []
Homemaker []
Other []
(Please specify _____)

YOUR SPOUSE

No spouse []
Owner/
President/Partner []
Vice President []
Manager []
Technical []
Sales []
Administrative []
Clerical []
Homemaker []
Other []
(Please specify _____)

31) What is the distance between your home and your office in kilometres? (If you work out of your home, please skip to Q33).

_____ KM

32) How long is your trip to and from work?

TO WORK: _____ MINUTES

TO HOME: _____ MINUTES or SAME AS ABOVE []

33) How large is your company in terms of full-time employees (including yourself)?

1 person only	[]	10-49	[]	250-999	[]
2-9	[]	24-50	[]	1,000 or more	[]

34) In what range was your gross (before taxes) annual income for 1990? Your spouse's gross annual income for 1990?

YOU

YOUR SPOUSE

Under \$25,000	[]	No spouse	[]
\$25,000 - \$34,999	[]	Under \$25,000	[]
\$35,000 - \$49,999	[]	\$25,000 - \$34,999	[]
\$50,000 - \$64,999	[]	\$35,000 - \$49,999	[]
\$65,000 - \$79,999	[]	\$50,000 - \$64,999	[]
\$80,000 - \$99,999	[]	\$65,000 - \$79,999	[]
\$100,000 - \$149,999	[]	\$80,000 - \$99,999	[]
\$150,000 or more	[]	\$100,000 - \$149,999	[]
		\$150,000 or more	[]

Thank you very much for taking the time to complete this survey. Please mail the completed questionnaire in the postage-paid envelope included in the package.

Any comments? Please write them on this page or attach a separate sheet.

Any questions? Please call or send a fax to the number written below.

Professor Linda Duxbury &
Robert Tannenbaum, M.M.S. Student
School of Business
Carleton University
Ottawa, Ontario

Ellen Maidman
Vice President, Marketing
National Cellular Group
Cantel

(613) 526-2959

COMMENTS:

APPENDIX 3 - UNUSED SCALE ITEMS

Time Management

(Bohen & Viveros-Long, 1981)

How easy or difficult is it for you:

- 1) To avoid the rush hour?
- 2) To go to work a little later than usual if you need to?
- 3) To take care of household chores?
- 4) To help or visit neighbors or other friends?
- 5) To participate in community activities?
- 6) To adjust your work hours to the needs of other family members?
- 7) To go places with your children after school?
- 8) To make alternative child care arrangements when necessary (e.g., school snow days)?

Work-Family Conflict

(Bohen & Viveros-Long, 1981)

Indicate the extent to which you agree or disagree with each of the following statements:

- 1) I worry that other people at work think my family interferes with my job.
- 2) I feel more respected than I would if I didn't have a job.
- 3) I worry whether I should work less and spend more time with my children.
- 4) I worry about my kids while I am working.
- 5) I have as much patience with my children as I would like.
- 6) I am comfortable with the arrangements for my children while I am working.
- 7) Making arrangements for my children while I work involves a lot of effort.
- 8) I worry that other people feel I should spend more time with my children.
- 9) I am a better parent because I am not with my children all day.
- 10) I don't have as much patience with my children as I would like.

Family Involvement

(Yogev & Brett, 1985)

To what extent do you agree or disagree with the following:

- 1) I would be a less fulfilled person without my role as a spouse.
- 2) I would be a less fulfilled person without my role as a parent.

Perceived Stress

(Cohen, Kamarck & Mermelstein, 1983)

How often in the last month have you:

- 1) Been upset because of something that happened unexpectedly?
- 2) Felt nervous and "stressed"?
- 3) Dealt successfully with irritating life hassles?
- 4) Felt that you were effectively coping with important changes that were occurring in your life?
- 5) Found that you could not cope with all the things that you had to do?
- 6) Been able to control irritations in your life?
- 7) Felt that you were on top of things?
- 8) Been angered because of things that happened that were outside of your control?
- 9) Found yourself thinking about things that you have to accomplish?
- 10) Been able to control the way you spend your time?

APPENDIX 4 - PEARSON CORRELATION COEFFICIENTS

MOTIVATIONS FOR USING A CELLULAR TELEPHONE

Motivations have been grouped as follows:

Job: M1 - More job control
 M2 - Faster turnaround time on work
 M7 - Stay in touch with clients
 M9 - Rearrange work schedule
 M10- Remain competitive in my industry

Job-related motivational correlations are highlighted with *****.

Family: M5 - Balance work and family demands
 M12- Manage family life

Family-related motivational correlations are highlighted with =====

Personal: M6 - Safety and security
 M8 - People can reach me
 M11- Schedule free time

Personal motivational correlations are highlighted with _____

General motivations that were analyzed separately (for an explanation, please see the Data Analysis section):

Parents: M13- Contact child's caregiver or school

Status: M14- Enhance status among colleagues and friends

Encouraged: M3 - By boss and/or colleagues to improve job performance
 M4 - By spouse to avoid overtime at the office.

THE PERCEIVED CONSEQUENCES

Except where noted in the Data Analysis section, all the perceived consequences were analyzed together using multivariate techniques. This was done in the interest of scientific parsimony since almost all of the consequences are highly intercorrelated and to conform to the Bonferroni Inequality (Stevens, 1986).

Key to Coefficient Table:

TIMEMGT = Time Management	PCONT = Perceived Control
PSTRESS = Perceived Stress	WFCNF = Work-Family Conflict
JOBSAT = Job Satisfaction	FAMSAT = Family Satisfaction
LIFESAT = Life Satisfaction	PRODUC = Perceived Work Productivity (1)
PRODUC2 = Perceived Work Productivity (2)	

----- PEARSON CORRELATION COEFFICIENTS -----											
VARIABLE PAIR		VARIABLE PAIR		VARIABLE PAIR		VARIABLE PAIR		VARIABLE PAIR		VARIABLE PAIR	
TIMEMGT WITH PCONT	.0170 N(514) SIG .351	TIMEMGT WITH PSTRESS	-.1501 N(513) SIG .000	TIMEMGT WITH WFCNF	-.5266 N(509) SIG .000	TIMEMGT WITH JOBSAT	.1878 N(505) SIG .000	TIMEMGT WITH FAMSAT	.0410 N(427) SIG .199	TIMEMGT WITH LIFESAT	.0954 N(513) SIG .015
TIMEMGT WITH PRODUC	-.0246 N(456) SIG .300	TIMEMGT WITH PRODUC2	.0583 N(463) SIG .105	PCONT WITH PSTRESS	-.5969 N(516) SIG .000	PCONT WITH WFCNF	-.2322 N(510) SIG .000	PCONT WITH JOBSAT	.2756 N(506) SIG .000	PCONT WITH FAMSAT	.1027 N(428) SIG .017
PCONT WITH LIFESAT	.4718 N(516) SIG .000	PCONT WITH PRODUC	.0520 N(455) SIG .134	PCONT WITH PRODUC2	.1132 N(462) SIG .007	PSTRESS WITH WFCNF	.3752 N(509) SIG .000	PSTRESS WITH JOBSAT	-.3181 N(505) SIG .000	PSTRESS WITH FAMSAT	-.1695 N(427) SIG .000
PSTRESS WITH LIFESAT	-.5075 N(515) SIG .000	PSTRESS WITH PRODUC	-.0335 N(454) SIG .238	PSTRESS WITH PRODUC2	-.1534 N(461) SIG .300	WFCNF WITH JOBSAT	-.3818 N(506) SIG .000	WFCNF WITH FAMSAT	-.0591 N(424) SIG .112	WFCNF WITH LIFESAT	-.2968 N(509) SIG .000
WFCNF WITH PRODUC	-.0232 N(455) SIG .311	WFCNF WITH PRODUC2	-.1464 N(462) SIG .001	JOBSAT WITH FAMSAT	.0199 N(421) SIG .342	JOBSAT WITH LIFESAT	.3269 N(505) SIG .000	JOBSAT WITH PRODUC	-.0334 N(456) SIG .238	JOBSAT WITH PRODUC2	.0547 N(462) SIG .120
FAMSAT WITH LIFESAT	.2009 N(428) SIG .000	FAMSAT WITH PRODUC	.0494 N(382) SIG .168	FAMSAT WITH PRODUC2	.0832 N(389) SIG .051	LIFESAT WITH PRODUC	.0084 N(455) SIG .429	LIFESAT WITH PRODUC2	.1512 N(462) SIG .001	PRODUC WITH PRODUC2	.3417 N(458) SIG .000

APPENDIX 5 - HISTOGRAMS OF TRANSFORMED VARIABLES

TRANSFORMED VARIABLES - REFLECT AND SQUARE ROOT

M1 MOTIVATION 1 - MORE JOB CONTROL

M1 MOTIVATION 1 - MORE JOB CONTROL

M6 MOTIVATION 6 - SAFETY AND SECURITY

Mean	4.248	Std dev	.996	Variance	.993
Kurtosis	2.073	Skewness	-1.513		
Valid cases	495	Missing cases	30		

MT6 MOTIVATION 6 (TRANSFORMED) - SAFETY AND SECURITY

Mean	1.279	Std dev	.340	Variance	.115
Kurtosis	.335	Skewness	1.031		
Valid cases	495	Missing cases	30		

FAMILY SATISFACTION SCORE

Count Value One symbol equals approximately 4.00 occurrences

Mean	4.187	Std dev	.844	Variance	.713
Kurtosis	1.410	Skewness	-1.156		
Valid cases	430	Missing cases	95		

FAMILY SATISFACTION SCORE (TRANSFORMED)

Count Midpoint One symbol equals approximately 4.00 occurrences

Mean	1.313	Std dev	.297	Variance	.088
Kurtosis	-.119	Skewness	.665		
Valid cases	430	Missing cases	95		

TRANSFORMED VARIABLES - REFLECT AND LOGARITHM

FAMILY INVOLVEMENT SCORE

Mean	3.839	Std dev	.956	Variance	.914
Kurtosis	-.189	Skewness	-.682	Minimum	1.000
Maximum	5.000				
Valid cases	471	Missing cases	54		

FAMILY INVOLVEMENT SCORE (TRANSFORMED)

Mean	.292	Std dev	.196	Variance	.038
Kurtosis	-.964	Skewness	-.075	Minimum	.000
Maximum	.699	Valid cases	471	Missing cases	54

TRANSFORMED VARIABLES - REFLECT AND INVERSE

M2 MOTIVATION 2 - FASTER TURNAROUND TIME

Count Value One symbol equals approximately 8.00 occurrences

```

  7      1.00  *
  8      2.00  :
 57      3.00  ***** .
160      4.00  ***** .
227      5.00  *****:*****
I.....I.....I.....I.....I.....I
  0      80     160    240    320    400
      Histogram frequency

```

Mean	4.290	Std dev	.862	Variance	.743
Kurtosis	2.010	Skewness	-1.335		
Valid cases	459	Missing cases	66		

M2 MOTIVATION 2 (TRANSFORMED) - FASTER TURNAROUND TIME

Count Midpoint One symbol equals approximately 8.00 occurrences

```

7      .20  :
8      .24  :
0      .28  .
57     .32  :*****
0      .36  .
0      .40  .
0      .44  .
0      .48  .
160    .52  **:*****
0      .56  .
0      .60  .
0      .64  .
0      .68  .
0      .72  .
0      .76  .
0      .80  .
0      .84  .
0      .88  .
0      .92  .
0      .96  .
227    1.00 *:*****
      I....+....I....+....I....+....I....+....I....+....I
      0      80     160     240     320     400
      Histogram frequency

```

Mean	.718	Std dev	.287	Variance	.082
Kurtosis	-1.738	Skewness	-.145		
Valid cases	459	Missing cases	66		

M7 MOTIVATION 7 - STAY IN TOUCH WITH CLIENTS

M7 MOTIVATION 7 (TRANSFORMED) - STAY IN TOUCH WITH CLIENTS

M8 MOTIVATION 8 - PEOPLE CAN REACH ME

Count Value One symbol equals approximately 8.00 occurrences

```

16      1.00  **
 9      2.00  :
28      3.00  ****
134     4.00  *****
320     5.00  *****:*****
I.....I.....I.....I.....I.....I
0      80     160    240    320    400
      Histogram frequency

```

Mean	4.446	Std dev	.919	Variance	.844
Kurtosis	4.655	Skewness	-2.118		
Valid cases	507	Missing cases	18		

M8 MOTIVATION 8 (TRANSFORMED) - PEOPLE CAN REACH ME

Count Midpoint One symbol equals approximately 8.00 occurrences

```

16      .20  **
9       .24  :
0       .28  .
28      .32  :***
0       .36  .
0       .40  .
0       .44  .
0       .48  .
134     .52  *:*****
0       .56  .
0       .60  .
0       .64  .
0       .68  .
0       .72  .
0       .76  .
0       .80  .
0       .84  .
0       .88  .
0       .92  .
0       .96  .
320     1.00 **:*****
          I.....+.....I.....+.....I.....+.....I.....+.....I.....+.....I
          0          80          160          240          320          400
          Histogram frequency

```

Mean	.792	Std dev	.279	Variance	.078
Kurtosis	-1.182	Skewness	-.727		
Valid cases	507	Missing cases	18		

M9 MOTIVATION 9 - REARRANGE WORK SCHEDULE

Mean	4.468	Std dev	.788	Variance	.621
Kurtosis	5.368	Skewness	-2.021		
Valid cases	464	Missing cases	61		

M9 MOTIVATION 9 (TRANSFORMED) - REARRANGE WORK SCHEDULE

Mean	.779	Std dev	.271	Variance	.073
Kurtosis	-1.485	Skewness	-.515		
Valid cases	464	Missing cases	61		

TRANSFORMED VARIABLES - SQUARE ROOT

TOTAL NUMBER OF FAMILY HOURS

Count Midpoint One symbol equals approximately 2.00 occurrences

Mean	8.599	Std dev	5.130	Variance	26.321
Kurtosis	1.745	Skewness	.934	Minimum	.000
Maximum	37.000				
Valid cases	503	Missing cases	22		

TOTAL NUMBER OF FAMILY HOURS (TRANSFORMED)

Count Midpoint One symbol equals approximately 2.00 occurrences

Mean	2.782	Std dev	.928	Variance	.861
Kurtosis	.591	Skewness	-.252	Minimum	.000
Maximum	6.083				
Valid cases	503	Missing cases	22		

**APPENDIX 6 -
PLOTS OF ORIGINAL VS. TRANSFORMED VARIABLES**

A total of 525 unweighted cases were used for the plots.

Frequencies and symbols used:

1 - 1	11 - B	21 - L	31 - V
2 - 2	12 - C	22 - M	32 - W
3 - 3	13 - D	23 - N	33 - X
4 - 4	14 - E	24 - O	34 - Y
5 - 5	15 - F	25 - P	35 - Z
6 - 6	16 - G	26 - Q	36 - *
7 - 7	17 - H	27 - R	
8 - 8	18 - I	28 - S	
9 - 9	19 - J	29 - T	
10 - A	20 - K	30 - U	

M1 VS. M1 TRANSFORMED (REFLECT & SQUARE ROOT)

M1 TRANSFORMED - MORE JOB CONTROL

433 cases plotted.

M2 VS. M2 TRANSFORMED (REFLECT & INVERSE)

M2 TRANSFORMED - FASTER TURNAROUND

459 cases plotted.

M7 VS. M7 TRANSFORMED (REFLECT & INVERSE)

M7 TRANSFORMED - STAY IN TOUCH W. CLIENTS

445 cases plotted.

M9 VS. M9 TRANSFORMED (REFLECT & INVERSE)

M9 TRANSFORMED - REARRANGE WORK SCHED.

464 cases plotted.

M6 VS. M6 TRANSFORMED (REFLECT & SQUARE ROOT)

M6 TRANSFORMED - SAFETY & SECURITY

495 cases plotted.

M8 VS. M8 TRANSFORMED (REFLECT & INVERSE)

M8 TRANSFORMED - PEOPLE CAN REACH ME

507 cases plotted.

FAMILY SATISFACTION VS. FAMILY SATISFACTION TRANSFORMED (REFLECT & SQUARE ROOT)

FAMILY SATISFACTION TRANSFORMED

430 cases plotted.

FAMILY INVOLVEMENT VS. FAMILY INVOLVEMENT TRANSFORMED (REFLECT & LOG)

471 cases plotted.

TOTAL FAMILY HOURS VS. TOTAL FAMILY HOURS TRANSFORMED (SQUARE ROOT)

503 cases plotted.

**APPENDIX 7 - DISCRIMINANT ANALYSES
FOR WORK AND FAMILY DEMANDS
BY FREQUENCY OF USE**

Discriminant Analyses were run for work and family demands by frequency of use. This was done in order to determine if the respondents were experiencing different levels of the demands at different frequencies of use. Statistical validation was necessary before it could be claimed that, for example, heavy users did have higher work demands than light users.

The means and standard deviations are provided in Table AP7-1. Tables AP7-2 provides the results of the Discriminant Analysis for work demands.

The discriminant function for family demands was not significant ($\alpha = .199$). In other words, there were no significant differences between light, medium and heavy users concerning their family demands.

The discriminant function for work demands was significant at $\alpha = .015$. According to the results in Table AP7-2, light, medium and heavy cellular users were more likely to be distinguished based on their number of work hours. Work involvement did discriminate between the three groups, but to a lesser extent. A group centroid plot for work demands by frequency of use is provided in Figure 16. Heavy users were more likely to have the highest work demands, medium users had the second highest work demands and light users had the lowest work demands.

Given the fact that there is no difference between light, medium and heavy users concerning family demands and that heavy users have the highest work demands, it can be said that heavy cellular telephone users have the highest levels of total work and family demands.

Table AP7-1 - Means and Standard Deviations:
WORK AND FAMILY DEMANDS by Frequency of Use

	LIGHT USERS		MEDIUM USERS		HEAVY USERS	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
WORK						
TOTAL WORK HOURS	10.7	3.67	11.4	4.05	12.1	3.59
WORK INVOLVEMENT	3.15	.931	3.22	.957	3.37	.929
FAMILY						
#TOTAL FAMILY HOURS	2.84	.951	2.97	.864	2.73	.914
+FAMILY INVOLVEMENT	.281	.203	.283	.184	.320	.195

Key: S.D. = Standard Deviation
= Regular Data Transformation
+ = Scale Reversing Data Transformation

Table AP7-2: Discriminant Analysis Results:
Work Demands by Frequency of Use

DEMANDS	SDFC	SC	DISC. RATIO COEFF.	MULTIV. DISCRIMINATOR	IMPORTANCE
TOTAL WORK HOURS	.853	.920	.785	Yes	1
WORK INVOLVEMENT	.398	.541	.215	Yes	3

Key: SDFC = Standardized Discriminant Function Coefficient
SC = Structure Coefficient
Disc. Ratio Coeff. = Discriminant Ratio Coefficient = SDFC $\times$ SC

Figure 16 - Group Centroid Plot for Work Demands Related to Frequency of Use

END

24 05 93

FIN