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The Effect of Microenvironmental Space on Communication and Job Satisfaction in an Office Environment: A Systematic Enquiry

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THE EFFECT OF MICROENVIRONMENTAL SPACE ON COMMUNICATION AND
JOB SATISFACTION IN AN OFFICE ENVIRONMENT:
A SYSTEMATIC ENQUIRY

A Thesis
Presented to
the Graduate Faculty in Communication
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In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Aparna Srinivas Bulusu
April, 1995
THE EFFECT OF MICROENVIRONMENTAL SPACE ON COMMUNICATION AND JOB SATISFACTION IN AN OFFICE ENVIRONMENT:
A SYSTEMATIC ENQUIRY

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It is difficult to accept that this document marks the termination of my formal education in communication. Looking back, I have become aware that the road has not been very clear and the ride not very comfortable. I had never imagined that I was capable of completing graduate level study. Through the past two years, I have been exposed to different points of view, concepts, and experiences. I became aware that the basis for our success rests on the people who gave us tutelage, time, support, encouragement, and patience.

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A total of 69 employees in various job positions working in cubicles in an open-office space plan, of a large organization, completed a questionnaire investigating the impact of microenvironmental space on communication and job satisfaction. Data was analyzed using quantitative research methods.

The results showed that a distinct lack of conversational privacy existed in this office. Also, when the level of noise decreased, the perceived level of privacy and job satisfaction increased. Excessive interaction, distraction, and communication with colleagues resulted in decreased level of communication privacy and job satisfaction.

In conclusion, the results of this study suggested two options for the decreased communication and job satisfaction: converting some space in the midst of all the cubicles into a gathering room to solve the problems such as lack of conversational privacy, distractions, and colleagues dropping in for a chat, or telecommuting. The researcher
designed a model depicting communication as the threading tool for various components of microenvironmental space leading to job satisfaction. Several areas for future research in microenvironmental space are briefly discussed.
Chapter I
INTRODUCTION

All human beings operate within a specific space whether at home or at work. Each person organizes the amount of space he/she occupies according to his/her needs. In a home where there are too many people living in a small space, the need for personal space or privacy might get disturbed. However, due to the rising cost of real estate, not everyone’s requirement for personal space can be met or satisfied. Given an unrealistically small amount of space to work with, twenty-first century architects face the enormous task of fulfilling numerous requests for personal space.

Satisfying everyone’s need for personal space is perplexing in a work environment, where large organizations seek space to comfortably house various employees without having them intrude on each other’s personal space. Solutions to the problem of lack of space is a subject that contemporary space planners and architects have to solve with the world’s rising population. Accommodating individual needs presents an entirely new set of design challenges for the office designer.
Personal space in an office or at home is a highly intriguing and interesting issue. Less personal space can contribute to the feeling of being crowded or lacking in privacy, whereas abundance of the same can bring forth a feeling of loneliness (Leathers, 1992).

The spatial distances/territories within which humans interact lead to transactions and relationships. If one's place of work does not deal with his/her need for personal space/territory, the communication and relationships with coworkers may be affected leading to unhappiness. An unhappy worker directly affects productivity and job satisfaction by not performing to his/her full potential (Leathers, 1992). For example, a large international organization has signified the importance of happy employees in their motto - People, Service and Profit-- i.e., if employees are happy, they will perform well, and the company will reap profit. Thus, employers who nurture their employees and treat them as people with individual needs and concerns are rewarded with both loyalty and increased productivity (Hayes, 1991). Therefore, if employees are highly satisfied, motivation increases, resulting in high levels of performance and personal well-being.

For over a decade, researchers have examined the impact of environments, and features of these environments, on perceptions, attitudes, and behavior. Environments can be classified into macroenvironments and microenvironments,
both of which function as powerful mediums of communication (Leathers, 1992). According to an extensive study conducted by Leathers on the communicative impact of micro-environmental variables, the terms proximate environment and micro-environment are used synonymously.

The defining features of micro-environmental space include furniture, lighting, color choice, decorative items, and, most importantly, the amount of space available and the way(s) that space is used (Sommer, 1969; Sommer, 1974; Sommer, 1983 as cited in Leathers, 1992). Renewed research efforts are focusing on the contribution of these features to worker satisfaction, communication and interaction, and other job related behaviors (Wineman, 1986).

Since the late 1980's, the design of the "open-office" space plan has gained great support. In an office with an open-space plan, there are no floor-to-ceiling walls, and permanent walls are eliminated, thus making it theoretically an extremely flexible work environment. Each person in an open-office space plan has a cubicle in which to function and perform his/her expected tasks, with/without another person sharing this space. The general objective of an open-office space plan is to assist communication and interaction among employees, while simultaneously increasing satisfaction and motivation (Becker, 1981).

For various people to work effectively, communication is essential. Since most people work in close proximity in
an open-office space plan, determining how their work environment affects their attitudes, motivation, communication capabilities, and job satisfaction is of crucial importance and significance. As Leathers (1992) states, "... designers of corporate micro-environments are highly concerned with the communicative significance of their decisions . . ." (p 366).

RESEARCH QUESTION

The goal in this research is to examine whether micro-environmental space, i.e., physical-environment in an open-office space plan in which one works, affects perceived levels of communication and job satisfaction. Issues evaluated in this research especially focus on loss of privacy, frequent interruptions by passers-by, audio and visual distractions, lack of sufficient personal space or territory, lighting, humidity, and job satisfaction.

Considering the plan of the existing open-office space and the work environment, this research was concluded by examining two options for work locations:

1. develop a model depicting communication as a threading feature between components of micro-environmental space leading towards higher job satisfaction.

2. changing the design, layout, or characteristics of the physical setting such as partition locations, carpeting, and movable furniture, and
3. the feasibility of telecommuting (working from home) as an option to employees as requested by the organization's management. Analysis was conducted based on responses received from a survey questionnaire.

The present research study tests the theory that an open-office space plan improves channels of communication and job satisfaction. This theory was tested in Tennessee at a well-known, large international organization which employed the open-office space plan. Data were gathered about the characteristics of the employees and their job responsibilities and duties. Such information proved extremely valuable when analyzing the information obtained after the research was complete. Data regarding gender of various employees were gathered to find any significant information.

The limitation of this study was that research had to be conducted at an existing office space employing an open-space plan. Thus, the respondents for the study were also automatically people employed in that specific office. The delimitation of this study was that due to the nature of the organization under study, research findings could be inferred to a large administrative (not industrial) organization and its employees.
Chapter II
REVIEW OF LITERATURE

Every organization’s physical setting or, in this case, micro-environmental space contributes a great deal to the "organizational climate." The term "organizational climate" does not imply the physical climate, but implies "feel" of a workplace (Steele, 1986).

This chapter is divided into three sections. The first section explains the role of communication in an organization and its impact on job satisfaction. The second section relates to variables of micro-environmental space such as personal space, privacy, and status symbols on communication and job satisfaction. The third and last section explains the open-office space plan and contains review of literature on telecommuting, which could be a part of the conclusion based on the results of the study.

SECTION ONE
COMMUNICATION IN AN ORGANIZATION

For many generations, mankind and civilization depended on some kind of "arrangement" or "organization." Survival of the great civilizations for centuries would be impossible
without collective and organized efforts. Such great civilizations came to an end in due course, leading today's researchers in quest of their downfall.

Every organization is dependent on communication, and successful communication is achieved through a dialogue. A dialogue in turn leads to active participation and "understanding" of participant's role in the work environment. To "understand" what is going on and to participate in it in some way, one must already have understood how it is organized - be it a game, a conversation or a board meeting. It is that "understanding" of how things are organized and an individual's role in their organization that makes human communication in the workplace possible or vice versa (Mumby, 1988).

Downs, Linkugel & Berg (1977, p.4) define an organization as "people making some input and using some technologies in order to produce some output." This definition holds valid for a social worker, a sergeant in the military, or even a person employed in a factory assembly line. A good analysis of organizational structure must account for all its principal components: people, structure, technologies, tasks or goals.

Communication between various employees is essential for an organization to be productive. As Tjosvold (1986) notes, working together directly affects motivation and productivity. The repercussions of a divided approach would
be that of a decline in employee communication and commitment to perform fully to his/her potential, resulting in decreased job satisfaction. Thus, every large and small organization should try to investigate whether there is a decline in the quality of communication between employees and job satisfaction and discover the appropriate reasons. Personal feedback from the employees is one of the best methods of obtaining answers to such queries. Previous studies by various researchers have tried to answer the same questions. An examination of these findings has lead the way for this research.

Job Satisfaction

The term "job satisfaction" refers to an individual's satisfaction with the job, all things considered. The micro-environment/physical environment can influence the job satisfaction through psychological processes (Sundstrom, 1986). Thus, if the employee finds the working conditions uncomfortable, the result will be dissatisfaction with work conditions and perhaps with the job itself.

SECTION TWO

MICRO-ENVIRONMENTAL SPACE

Earlier research conducted by Watson (1972) used a similar term "Mesospace" which he defined as follows:

being concerned with the ways in which architectural units are internally structured, and the ways in which
movable features of the mesospatial environment are used as props in interaction. (p 20-4)

According to Leathers (1992), physical features of the micro-environment can and sometimes do serve communicative functions. In an open-office space plan, partitions are used to define the macro-, midi-, and mini-environments in which people interact.

At the turn of the century, designers used the physical environment to promote accessibility of workers for workflow and supervision (Sundstrom, 1986). Open-office space plans were designed with the idea that visual access and physical proximity created opportunities for face-to-face conversation; workers were thought to increase communication given such an opportunity and promote interpersonal relationships (Sundstrom, 1986). This movement was termed "Burolandschaft" or "office landscape." However, as different jobs required differing levels of privacy, some research showed that "Burolandschaft" instead of enhancing communication resulted in decreased communication (Wineman, 1986).

Pile (1984) listed potential advantages to an open-office space plan some of which are mentioned below:
1. There is a major cost saving by eliminating doors and walls.
2. There may be a saving in floor space requirements leading to savings in rent or construction.
3. Organizations experience more flexibility in
rearranging workspace according to work flow.

A list of potential disadvantages may include:

1. Loss of privacy makes some work impossible.
2. Noise and overheard conversations from adjacent cubicles are a source of annoyance.
3. An open plan office is considered inferior to a private office (as some people regard a private office as a status marker of great significance).
4. The open-space office can be dehumanizing and depressing.
5. Large areas of open plan layout tend to have partitions of the same height resulting in a dull, monotonous outlook over a sea of partition-tops (Steele, 1986).

Research has suggested that workers consider the physical environment in which they work as a factor of job satisfaction. Physical working conditions clearly represent a component of job satisfaction (Hertzberg, F., as cited in Sundstrom, 1986, p.78), as depicted in Figure 1. Every component of the physical environment such as noise, lighting, temperature etc., is unlikely to show great influence on job satisfaction by itself, but on a holistic level the physical environment is important to job satisfaction (Steele, 1986; Sundstrom, 1986; Watson, 1972).

However, for this research, components of the physical environment such as air quality, temperature, color choice,
Fig. 1. The physical environment as a component of job satisfaction (Sundstrom, 1986, p. 80).
furniture & equipment were not considered in detail. These factors would have facilitated a study from an architectural viewpoint, and necessitated measurements by specialized instruments such as hydrometers, etc. The current research thus mainly focused on the facet of noise, status and privacy as micro-environmental/physical variables that affect perceived levels of job satisfaction and communication.

But, before examining the variables of noise, privacy and status, it is crucial to study the various components that are a part and parcel of "privacy." All the facets of micro/physical environment are discussed below in order of importance, with regard to this study.

PERSONAL SPACE

At home or at work, every human being has a need for his/her own personal space or territory. Scheflen & Ashcraft (1976) defined territory as "the particular forms of bounded space that people establish, use, and move about in."

All humans participate in several transactions, which can take place in an intimate, personal, social, or public setting. While participating in a transaction, the spatial distances that two people have in between them have been researched and classified in detail by anthropologist and authority in the field of personal space Edward Hall.
Hall’s intensive research in this field resulted in the classification of the four spatial distances/territories: Intimate - six to eighteen inches, Personal - two and a half to four feet, Social - four to seven feet, and Public seven to twelve feet. The study of man’s transactions as he perceives and uses intimate, personal, social, and public space in various settings is termed as proxemics. Thus, the study of proxemics can be defined as the perception and use of personal and interpersonal space. According to Hall (1966), the one mistake that man makes is assuming that man’s spatial boundaries start and end with his skin.

Hall (1969) further contends that there are three types of space within which humans function: fixed feature, semifixed feature, and informal space or non-fixed feature space. Each is hereby discussed in detail:

1. Fixed-feature space refers to the characteristic arrangement of rooms by function.

2. Semi-fixed feature space stands for the manner in which objects are placed in homes, offices, and other proximate environments. According to Leathers (1992) "the objects which we choose - to demarcate the boundaries and to accent the meanings of the semi-fixed feature space in which we interact - are important because often they are a direct extension of our personality." He further contends that perhaps the most important communicative function of semi-fixed
feature space is the degree to which it promotes involvement or withdrawal among the individuals who are using the space. Hall also states concerning semi-fixed feature space that it can have a profound impact on one's behavior.

3. Non-fixed feature space is that space immediately surrounding one's body that each perceives to be his/hers.

PRIVACY

"Privacy is not only a necessity, but ironically also one of our greatest luxuries" (Insel, 1987, p.145). Once the spatial distances between people are intruded, their privacy gets invaded either advertently or inadvertently. Sommer (1969, p.171) says "for Americans privacy is mainly a matter of visual protection against other people...."

Privacy has been defined as the ability of individuals or groups to control the communication of information about themselves to others (Westin, 1970). According to Sundstrom, Burt and Kamp (1980), privacy can further be defined in two ways: a psychological state, and a physical feature of the environment (architectural privacy). Psychological privacy stems from a feeling of control over access to oneself or to one's group, while architectural privacy alludes to visual and acoustic isolation supplied by the environment. A person's privacy can also be affected at
the workplace. Research on open-space offices has suggested that generally privacy decreases when employees move into open offices (Wineman, 1986).

Sundstrom et al. (1980) conducted a study to examine the relationship between architectural privacy, psychological privacy, job satisfaction, and job performance. The results of the study suggested that both forms of privacy were indeed associated with satisfaction in respect to workspace and job satisfaction. Employees in a variety of jobs preferred more privacy than was offered by many of the workspaces investigated.

At the same time, Sundstrom (1978) also thought that crowding might produce discomfort and downgrade job performance. When a person experiences more social stimulation or interaction than desired, the result is in feeling crowded. Steele (1973) complemented Sundstrom's statement when he stated that if a particular setting was experienced as unpleasant or if one person felt lack of control over their personal space, we can assume that, 1) they will tend not to go back to those settings, 2) they will hurry and finish the task at hand and leave, or 3) they will psychologically block out their displeasure and dissatisfaction, which will lead to stress, dissipated energy, and dissatisfaction (all three lead to breakdown in communication and job satisfaction). Thus, a satisfactory workspace has direct implications on daily life (Wineman,
In conclusion, the authors expressed that having privacy at the workplace remained an important issue with practical implications of design and management of physical environments. In a scenario where the lack of architectural privacy causes social or public conversation to become a personal or intimate conversation, the lack of space in one's workspace results in a feeling of intrusion in personal space and privacy. Due to the lack of closed private offices, people feel that they cannot control interruptions and intrusions. Little attention is given to lines of sight and relationships of desks to traffic ways (Steele, 1986). As Sundstrom states (1986) the environment can play a role in bringing people too close for comfort, especially when the room is too small to conveniently accommodate the occupants.

Types of Privacy

According to Becker (1982) enough space, storage, and privacy, good lighting, and comfortable chairs are at the core of worker satisfaction. He later says that (1982, p.52) to accommodate one's lifestyle, a workspace should offer three kinds of privacy:

1. Communication - referring to those situations in which all types of communication can take place with minimum restrictions. Privacy is related to communication in
that it represents a form of control over interactions between people. This privacy is primarily important while conveying negative information, since people do not say the same things in private as in public. Other noise, movement, and conversations, termed as conversational privacy by Wineman (1986), make some employees less efficient. If one's workspace does not offer visual privacy, a messy workspace might communicate a negative message to the supervisor or boss walking by. Visual privacy means isolation from unwanted observation (Sundstrom, 1986). In the same vein, if something has to be sacrificed, visual access more than auditory access, termed by Wineman (1986) as speech privacy, is what most people will give up. Thus, privacy can also be a prerequisite to confidential communication.

2. Concentration - referring to the individual amount of privacy, inactivity, or quietness required for each individual to concentrate in order to perform properly and efficiently. According to Steele (1973), "a feature of open-office design that is detrimental to concentration is the lack of a door . . . and thoughtful work will suffer." He further states that workspaces located in the path of heavy traffic also succumb to the same problem. This issue can also be termed "social interaction versus privacy" or "contact
and stimulation versus withdrawal and concentration" (Steele, 1986).

3) Contemplation - referring to a person's need to attend to oneself - to reflect and relax. The paradox of contemplation or personal privacy is that it is the foundation of all work effectiveness - yet it seems to be the essence of nonwork.

STATUS AND POWER

The term status is defined as (Konar & Sundstrom, 1982) "the value placed on an individual in comparison to other individuals." Though a particular space might be familiar in size and layout, unusual noise, lighting, heating, and crowding interfere with work and communication, ownership and control, and with mobility and regulation (Scheflen & Ashcraft, 1976).

Privacy is also closely related to status, power and ownership. The open plan layout has led to the necessity for people to live without traditional private offices (Steele, 1986). Mehrabian (1976) contends that the degree of proximity of a desk or cubicle to the center of power usually indicates its importance or power. Location of one's workplace within a certain area also carries a message about power. A corner office seems to have intrinsic value in its remoteness from traffic and multiple view points of the outside world (Konar & Sundstrom, 1982). Degree of
enclosure and its control of accessibility provides relatively costly but much desirable freedom from disturbance and other types of unwanted access. Some designers in an effort to give more status by increasing privacy to employees provided a maze of cubicles (frequently cubicles have floor to ceiling partitions; in others the partitions are chest high). However, the maze of cubicles can disorient a person, so he/she wastes time in finding the other areas way around. Thus, a maze brings about a feeling of lack of power or importance (otherwise he/she would be in an office). Morale of employees can also decrease when employees who traditionally judged their status by walls and doors find themselves in a status-less environment.

The theory related to status congruency suggests that office workers experience greatest satisfaction in workspaces they regard as appropriate to their status.

NOISE

Research on noise in offices has included studies of the prevalence of noise and its correlation to dissatisfaction with the physical environment and the job. According to Sundstrom (1986) noise has been a prevalent source of complaint about the physical environment in the study of offices. He says that the most disturbing source of noise was not usually the loudest as sounds of office equipment or traffic, but conversations by co-workers and
telephone rings. Both have been associated with job dissatisfaction among employees.

LIGHTING

The level of lighting can have a great effect on the character of any event, and the possibilities of changes in lighting are often underutilized in organizations (Steele, 1986). Designers of office space are often faced with the dilemma of providing sufficient lighting for everyone without creating a glare, while at the same time creating a satisfying ambient work environment. Some offices provide "task-lighting" which is extremely adjustable and so has several advantages.

TEMPERATURE

According to Sundstrom (1986), "temperature is apparently associated with much dissatisfaction in offices...." Unfortunately, individual control over temperatures is difficult to achieve and managers can encourage employees to use small heaters or fans as need be. If employees' concerns go unnoticed, they may become dissatisfied not only with the physical environment but also the management.

AIR QUALITY

Poor air quality in the work environment once was a
major concern especially in offices and factories. However, with the ban of smoking inside most offices and work buildings, this problem has been curtailed and is eliminated from most offices. Cigarette smoke posed a large problem for office workers in previous years. Even the perception that air pollution exists can create stress among employees who believe that it poses a health problem. Some of the negative impacts associated with poor air quality are decreased performance on vigilance tasks (Wineman, 1986).

COLOR

In any environment, colors need to be used thoughtfully. Color has been said to have an impact on employee work performance (Pile, 1984). Dull colors seem, however, to have a depressing effect on user’s energy level (Steele, 1986). Employees are often unenthusiastic about white, gray and neutral color schemes, while warm colors are much more preferred and are related to higher work performance. Color remains a personal symbol (Shoshkes, 1976), and behavioral science can help a designer create an environment that meets the user needs in an office.

The third and last section explains the open-office space plan and telecommuting.
SECTION THREE

OPEN-OFFICE SPACE PLAN IN RELATION TO PRIVACY

According to Sundstrom (1982), privacy depends to a certain extent on physical seclusion, which is available in varying degrees in the office. When the open-office space plan began to appear in the 1960's, the premise was that the open design made workers accessible to each other and encouraged face-to-face communication. However, results of several studies in open-space plan offices suggested that certain types of communication deteriorated, notably confidential conversations. Several studies concluded that physical enclosure by walls or partitions is strongly associated with privacy in an office (Sundstrom, 1980).

In 1976, Albert Mehrabian, a scholar in the field of psychology, wrote that doorless cubicles provided a much less flexible workspace than did cubicles with doors. Doorless cubicles did not offer shelter from extraneous environmental stimuli, such as people walking by or a conversation down the hall, but instead isolated workers from one another. The solution suggested by Mehrabian (1976) was that the lower-echelon employees who perform loaded tasks be assigned offices with doors for increased privacy (Figure 2). Should an employee need privacy, it is up to him/her to close or leave the door open. He also believed that many of the variables involved such as size of the cubicle, furniture, carpeting, lighting, wall color and
noise control could not be directly under one’s control, as they were decided by superiors and paid designers. Most levels of employees within an organization learn to take their workspaces for granted assuming that they have little say in size, location, and style (Steele, 1986). However, Sundstrom (1986) feels that if the employee gets to participate in design of his/her workspace, it can be a channel for expressing self-identity.

In 1982, Spreckelmeyer & Marans attempted to corroborate findings reported by others that conventional offices were viewed more favorably by people occupying them than employees in an open or pool office arrangement. They developed a conceptual model that specified the kinds of environments and suggested the manner in which they were linked to job satisfaction and work performance.

Several components of the model were then examined in a case study, conducted in a federal office building. Findings of the study revealed that the amount of workspace available to the worker was the most important factor associated with work station satisfaction. However, the study did not examine the relationship between overall environmental satisfaction on job performance and communication, vice versa.

Sundstrom (1980) examined another aspect of the relationship between workspace and job performance. He pronounced that as the complexity of the task increased the
desired amount of social contact decreased. People with complicated tasks may require greater freedom from distraction and, thus, require more architectural privacy for greatest job satisfaction and job performance. A similar study by Sinha & Sinha (1991) also concluded that density as well as personal space did not affect performance in simple tasks, but significantly affected performances on complex tasks. Thus, for people performing repetitive or simple tasks, a nonprivate workspace might provide two advantages: 1) Those who find jobs monotonous and uninteresting, might find that contact with other people provides the necessary stimulation, 2) evidence shows that routine tasks are performed better in nonprivate areas.

In 1982, Sundstrom et. al. conducted a survey to analyze the hypotheses that 1) physical enclosure is associated with perceived privacy of workspace, and 2) privacy would become more important for job satisfaction with the workspace as well as highly complex job tasks. The second hypothesis was, however, not supported as results suggested that people with different job duties perceived privacy differently.

In 1982, Hedge conducted an extensive self-completion survey questionnaire on 649 employees at all job levels working in open-plan offices, on their work and office environment. The aims of the study were to examine general reactions to the open-plan offices and, secondly, to collect
information on a variety of characteristics of employees and their work. The sample consisted only of people working in the open-plan offices, and thus excluded those working in private offices. Seventy percent of the respondents were men and thirty percent were women. Results of this study indicated that

1. Lack of privacy and high levels of distractions affected employee work, complementing previous findings.

2. Since the office remained relatively unchanged for several years, employees viewed the office accommodation as "pseudo-fixed-feature space," that is space appearing fixed, but in fact, is not. Screens, filing cabinets etcetera were used as unmovable territorial markers.

3. Though the open-plan office created a favorable social climate, this did not compensate for employees negative reactions to work conditions, but instead appeared to aggravate the problems.

4. After this study was completed, the organization reorganized a reasonable amount of offices by installing numerous ceiling-to-floor partitions thereby creating a more conventionalized office accommodation. The above study by Hedge (1982) closely resembles the research design and intent of this study. Nevertheless, due to the nature of the research design, results obtained by
Hedge's study cannot be generalized to this study. More than a decade has gone by, during which time significant changes have occurred in the operations of offices along with the subsequent rapid automization of the workplace. The Hedge (1982) study could not take into account these changes nor did it ask the communication questions posed in the present research design.

Therefore, the review of literature revealed only one complementary theoretical framework by Hedge (1982). Within the limitations of conducting a review of literature, the researcher found that previous studies left unanswered questions as to solutions for the problems of the effect of micro-environmental space on communication and job satisfaction.

The following part contemplates telecommuting as one of the feasible solutions.

TELECOMMUTING

With the changes and implementation of new technology in office functions, this study is one of the very few to weigh the feasibility of telecommuting as an option to ineffective work conditions, and the rising cost of real estate, with the possible results of freeing up office space for other uses. A major reason for the increasing office cost is the increasing number of workers being added to the office labor force. As the number of employees increases,
equipment and equal number of offices need to be created in the same amount of space to accommodate these new employees.

Cross & Raizman (1986, p.3) define telecommuting as "performing job-related work at a site away from the office, then electronically transferring the results to the office or to another location." Technology such as high-power, low-cost personal computers, ISDN (Integrated Services Digital Network), facsimile machines, and telephones have made telecommuting possible. Romei (1992) estimated that by the end of the 1990's, one-third of the workforce is expected to work full-time or part-time at home. By making use of technology to transport information, employers can cut office expenses, save energy and commuting time, increase job satisfaction, and respond to employee's changing lifestyle needs. According to Lefkovich (1992), an estimated 25% of employees with elder-care responsibilities said that they were forced to dedicate work time to caregiving. Smith, Michaels & McCarty (1991) also stated that companies see the effects of work-family problems (young children) through increased absenteeism, decreased productivity, and loss of revenue. For example, a single parent could spend time at home and still work at home, resulting in decreased absenteeism and increased productivity. The telecommuting trend also implies that there is a need for more attention to workplace design and use of policies that permit overlap between home and
workplace settings - recreational facilities, regular visits, places for families to come and see the work setting (Steele, 1986).

Hartman, Stoner & Arora (1992) conducted a survey to investigate whether productivity was higher or lower at home than at the office. The respondents for the study were 262 telecommuters, of which an overwhelming 84% reported higher productivity when working at home. The reduced cost of communications equipment and the escalating cost of real estate have played a pivotal role in turning the concept of telecommuting into reality.

According to an anonymous author/s (1992) several advantages exist in telecommuting even for the employer such as 1) improvement in employee productivity, effectiveness, and morale, 2) reduction in office space and parking facility requirements. Some advantages for telecommuting employees include 1) reduced commuting time, 2) increased flexibility to coordinate work schedules with personal and family priorities, and 3) reduced transportation and parking costs. Ramsower (1985) goes on to say that telecommuting offers a work option which can relieve the organization of the necessity to furnish office space and the other normal conveniences associated with that space.

The following chapter discusses the research design and explains the sample, area of work, designing a questionnaire for purpose of this study, and how the study was conducted.
Chapter III
METHODOLOGY

Research is absolutely necessary in the field of communication. Only through consistent examination, classification, acceptance or rejection of related hypotheses can operational principles be developed to provide large corporations with insights into the numerous factors that influence and stimulate communication and job satisfaction.

RESEARCH DESIGN

This study was conducted on the premises of a large organization, designed on the open-office space plan, thus making it a naturalistic study (without manipulating the observational environment). The location for the study also made it a field research, since it was conducted in the communicator's natural environment. The data was collected by a survey tool making the respondents aware that they were participating in a survey, thus making the research design overt. The focus of the study was the present condition making the research a cross-sectional research (examining communication events at a single point in time). The
researcher played a nonparticipant role, not entering into the target of communicative interactions in any way.

SAMPLE

The sampling frame for this study required the subjects to fulfill two conditions: 1) they were required to be employees in a large organization, and 2) they had to work in an open-space plan office (cubicle). Since the entire sampling frame would be impossible to study, the stratified sampling method was used to generate a more realistic sampling frame. The final sampling frame was advantageous in two respects: 1) A convenient sampling frame was available, 2) Access to the sampling frame was possible.

The population investigated consisted of employees in a large international organization whose worldwide headquarters was based in Memphis, Tennessee. Most if not all of the employees in this department had a high-level of education, undergraduate and graduate studies, with a few doctorates. The department being the Worldwide Headquarters for Customer Service Planning & Training required some employees to travel within the United States as well as around the world. So the employees had extremely tight project schedules and deadlines, worked at their convenience (such policy being known as flextime).

The respondents were located on the third floor of the headquarters, one of the three floors that used the open-
space plan office design. Though the total number of employees in the building approximated 1000, some employees who occupied private offices were excluded from the study. Also, several unforseen legal considerations forced the researcher to bring the sample down considerably:

1. Permission for conducting the survey within office premises/property was denied.
2. The respondents could not answer the questionnaire within office premises/property, or during work hours.
3. Only employees of the Worldwide Customer Service Department could participate in the study. The result was that the number of respondents participating in the study being brought down to 115. Because some of these employees occupied private offices, they were automatically excluded from the study, thereby bringing the cubicle’s sample down even further to 103. Some of the employees who worked in cubicles in the Worldwide Customer Service Department were travelling, thus requiring a change in the methodology of conducting the survey.

AREA OF WORK

To conduct this study, the researcher met with management to gain authorization. Permission was granted to conduct the study within the Worldwide Customer Service Planning & Training Department, located on the third floor
of the worldwide headquarters. A detailed floor plan was obtained from the Facilities Management department clearly showing the number and arrangement of cubicles on the third floor (Figure 3).

QUESTIONNAIRE

This study was a systematic inquiry, and the data were collected keeping in consideration the objective of this study. A self-report questionnaire was designed by the researcher as the research tool for the final data collection. A statement at the beginning of the questionnaire assured respondents of the confidentiality of the information gathered and also explained the purpose of the study.

The questionnaire contained factual and opinion closed questions relating to respondents sex, job satisfaction, job characteristics (clerical, technical or professional, etc.), physical factors (office layout, lighting, electrostatic, humidity), communication privacy, distractions, and office conditions. The color of cubicles was not a variable in this study since that would warrant an entire study in itself and since every individual has different color tastes and perceptions which due to a high cost cannot be satisfied.

The questionnaire was designed to avoid establishing a response bias by associating five-point Likert scales
Fig 3. Third floor plan.

Worldwide Customer Service
Planning and Training
(Area of Study)
(ranging from "Strongly Agree" to "Strongly Disagree") with a few buffer questions interspersed, and a seven-point Semantic Differential scale, thus giving the researcher valuable interval level data for quantitative data analysis (Appendix A).

DATA COLLECTION

To reach the respondents the self-report questionnaire survey was given to each respondent visiting the breakroom during the workday, but to be filled out after work outside office premises, by the researcher who introduced herself and explained the purpose of the study. A questionnaire survey was accompanied with a self-addressed stamped envelope. While the researcher was in the breakroom, an employee of that department went around the office notifying the respondents of such a study and requesting them to go to the breakroom to pick-up a questionnaire.

All the questionnaires were distributed on location, in the breakroom for five workdays: March 16-17, 1995 - Thursday & Friday, March 20-22, 1995 - Monday, Tuesday and Wednesday, from 7 a.m. to 3 p.m. A few of the questionnaires were left in the breakroom so that some respondents could obtain questionnaires at their convenience. The breakroom in the organization contained soft-drink and snack vending machines and a few tables with chairs for employees to use. However, the breakroom on this
particular floor was located at a distance from the Worldwide Customer Service Department, which required the respondents to go out of the way and take a questionnaire. Thus, the researcher thought it appropriate that the distribution continue for five days to reach all the respondents. All responses obtained on or before April 2, 1995, were included in this study.

The following chapter will include analysis of the responses received and also an explanation of the significance of the important results obtained from this study.
Chapter IV
RESULTS

The Worldwide Customer Service Department consisted of 103 cubicles total, of which 23 were empty, thus bringing the respondent sample down to 80 (an additional 12 employees worked in private offices). Due to the legal limitations and the small sample, a high response rate was mandatory. To extract a higher response rate, the researcher incorporated the following steps in the methodology of this study:

1. As and when possible, the researcher walked around the department personally thanking those respondents who had already mailed back the questionnaire, and asking those who had not participated in the survey to obtain a questionnaire from the breakroom.

2. Designed thank-you/reminder notes on fluorescent paper (Appendix B) which were displayed on bulletin boards located within the department (permission was denied to distribute the notes in the cubicles at any time).

A total of 80 questionnaires were distributed of which 69 employees mailed the responses back to the researcher, a
high response rate of 86%. The data gathered were analyzed applying quantitative research methods on the SPSSX software. Of the 69 responses, 35% (24) of the respondents were men and 62% (43) women (Q.29), generally reflecting the pattern of employment in this department. Two respondents did not indicate their gender.

This section includes discussion of the results analyzed from the questionnaires. For ease of understanding, questions have been grouped together as per variables (Table 1). The questionnaire is located in Appendix A. Results also have question numbers before them, for the reader to refer to the original question.

JOB DESCRIPTION AND CATEGORY

Respondent Description

(Q.30) Out of the total 69 responses, 58% (40) occupied professional roles, 22% (15) were in administrative roles, 10% (7) in secretarial roles, 7% (5) in technical roles, 3% (2) in managerial positions, and none in supervisory positions. Depicted in Table 2 is a bar chart between gender and job description which gives an pictorial outlook of the relation between the two.

(Q.8) Eighty percent (55) of respondents described their job as requiring deep concentration and thought
Table 1. List of variables and respective questions asked.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>CODING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Category</td>
<td>Secretarial (1)    Administrative (2)</td>
</tr>
<tr>
<td></td>
<td>Supervisory (3)    Technical (4)</td>
</tr>
<tr>
<td></td>
<td>Professional (5)   Managerial (6)</td>
</tr>
<tr>
<td>Job Description</td>
<td>&quot;my job requires.&quot;</td>
</tr>
<tr>
<td></td>
<td>Deep concentration (1) vs Stimulating environment (2)</td>
</tr>
<tr>
<td></td>
<td>&quot;I use the following equipment at work.&quot;</td>
</tr>
<tr>
<td></td>
<td>Telephone, Fax, Typewriter, Computer, Laser Printer, Television, Video Equipment, Modem, Copy Machine Yes (1) vs No (0)</td>
</tr>
<tr>
<td>Communication</td>
<td>&quot;.have sufficient overall privacy&quot;</td>
</tr>
<tr>
<td></td>
<td>Strongly agree (5) vs Strongly disagree (1)</td>
</tr>
<tr>
<td></td>
<td>&quot;discussing confidential matters difficult&quot;</td>
</tr>
<tr>
<td></td>
<td>Strongly agree (5) vs Strongly disagree (1)</td>
</tr>
<tr>
<td>Proximity</td>
<td>Far from co-workers (7) vs Close to co-workers (1)</td>
</tr>
<tr>
<td>Distractions</td>
<td>&quot;I sometimes get distracted by...&quot;</td>
</tr>
<tr>
<td></td>
<td>Others talking, Colleagues dropping in for a chat, Cross-talk over partitions, Telephone conversations, Telephone rings</td>
</tr>
<tr>
<td></td>
<td>&quot;.how much time a day does someone else come to your cubicle for a social chat?&quot;</td>
</tr>
<tr>
<td></td>
<td>Less than 15 min. (5) vs More than 1 hour (1)</td>
</tr>
<tr>
<td>Noise</td>
<td>Quiet (7) vs Noisy (1)</td>
</tr>
<tr>
<td>Lighting</td>
<td>Too bright (7) vs Too dim (1)</td>
</tr>
<tr>
<td>Humidity</td>
<td>Too humid (7) vs Too dry (1)</td>
</tr>
<tr>
<td>Storage Space</td>
<td>&quot;have sufficient storage space&quot;</td>
</tr>
<tr>
<td></td>
<td>Strongly agree (5) vs Strongly disagree (1)</td>
</tr>
<tr>
<td>Electrostatic</td>
<td>Frequently (1) vs Occasionally (2)</td>
</tr>
<tr>
<td></td>
<td>Rarely (3) vs Never (4)</td>
</tr>
<tr>
<td>Orientation</td>
<td>&quot;I find the floorplan easy to follow&quot;</td>
</tr>
<tr>
<td></td>
<td>Strongly agree (5) vs Strongly disagree (1)</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>&quot;conducive to working to my full potential&quot;</td>
</tr>
<tr>
<td></td>
<td>Strongly agree (5) vs Strongly disagree (1)</td>
</tr>
<tr>
<td>Dependents</td>
<td>&quot;do you have any dependents?&quot;</td>
</tr>
<tr>
<td></td>
<td>Infant/s (1) vs Elderly (2)</td>
</tr>
<tr>
<td></td>
<td>Inf/Std (1) vs None (0)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male (1) vs Female (2)</td>
</tr>
</tbody>
</table>
Table 2. Relation between Job Category and Gender.
to perform well. A test of correlation between this question and whether the cubicle was conducive to working to full potential revealed a correlation of .4437, p < .01.

I use the following equipment at work:

(Q.17-25) All respondents used telephones, computers and copy machines equally. A few responded to using television, typewriters and video equipment. Analyzing this question helps in concluding whether telecommuting is a feasible option for employees. Table 3 shows which job positions used what type of equipment at work.

COMMUNICATION

Overall privacy

(Q.10) When asked whether the cubicles provided sufficient privacy 70% (48) of the respondents disagreed, while 17% (12) agreed and 12% (11) were unsure. Employees in secretarial (100%) and professional (73%) positions seemed to strongly agree that they had insufficient privacy as compared to others. Significant correlations were found between:

a) Level of perceived job satisfaction and level of communication privacy (.3855, p < .01)

b) Perceived noise level and perceived overall
Table 3. Equipment employees use in various Job Positions.
privacy (.2967, p < .05)
c) Proximity with co-workers and perceived level of privacy (.2573, p < .05)
d) An inverse correlation between telephone conversations and perceived level of privacy (-.2925, p < .05)

Ability to discuss confidential matters
(Q.7) Almost all (93%) of the respondents felt that they had difficulty in discussing confidential matters, while only 6% (4) thought differently (audio privacy). Both genders very closely agreed (Male=92%, Female=95%) about not having sufficient privacy to discuss confidential matters, but administrators and professionals seemed to be bothered the most (93%). However, no significant correlation was found to exist between perceived lack of confidential privacy and overall privacy, or perceived job satisfaction.

Proximity to co-workers
(Q.3) Seventy-one percent (49) of the respondents thought that they were close to co-workers, and only 4% (3) thought that they were far from co-workers. Seventy-five percent of the males and 70% of females thought they were close to co-workers, but most of them were technical and professional employees (80% and 83%
respectively). Only 19% of secretarial employees (all females) thought that they were close to co-workers. A significant correlation was found between proximity with co-workers, and perceived level of job satisfaction (.4345, p < .01)

Distractions due to the open-space plan design:

(Q.11) Eighty percent (55) responded that they were distracted by others talking. Males seemed more bothered by others talking (83%), just about the same as females (79%), of which most were in secretarial and administrative positions.

(Q.12) Eighty-four percent (58) got distracted by colleagues dropping in for a chat, of which 30% (15) said that colleagues chatted for 16-30 min., 37% (19) for less than 15 min., and only 8% (4) reported being talked to for more than 1 hour. Colleagues dropping in for a chat bothered males slightly more (88%) than females (84%)

(Q.13) Sixty percent (44) got distracted by cross-talk over partitions. Once again, males were distracted more by cross-talk over partitions (71%) as compared to females (54%) in this study. Respondents in technical (100%) and professional (60%) positions reported high distractions as compared to other positions.

(Q.14-15) Sixty percent (44) got distracted by
telephone conversations and telephone rings. Both sexes seemed equally distracted by telephone conversations (66%) and telephone rings (53%). But again, respondents in technical (100%) and professional (70%) positions reported high distractions as compared to other positions.

Please see Table 4 for a pictorial representation of the above results.

Colleagues dropping in to the cubicle for a social chat (Q.16)

a) For less than 15 min. - 33% (23). More males (38%) were talked to in this time frame by colleagues than females (29%).

b) For 16-30 min. - 32% (22). More females (41%) were talked to in this range than males (21%).

c) For 31-45 min. - 19% (13). Females were talked to more (24%) than males in this time (12%).

d) For 45-60 min. - 9% (6). A considerably greater number of males (21%) were talked to than females (3%).

e) For more than 1 hour - 6% (4). Only two males and females reported being talked to by colleagues for more than an hour.

This study also found that less time an employee was talked to, the level of job satisfaction was higher (.3426, p < .01). Please see Table 5 for a view of the results.
Table 4. Responses of Distractions by Gender.
Table 5. Amount of Social Chat Time by Gender.
PHYSICAL ENVIRONMENT

I find my cubicle noisy

(Q.2) Forty-six percent (32) of respondents thought that the cubicles were noisy while only 11% (8) thought that their cubicle was quiet. Females rated their cubicles as more noisy (53%) than males (37%). Secretaries did not rate noise as high as administrative (40%), technical (40%) or professional (52%) respondents. A significant correlation was found between perceived level of quiet and job satisfaction (.3241, p < .01)

I find the lighting in my cubicle to be:

(Q.4) Majority of respondents thought that the existing lighting was adequate (45%). Only 26% (18) of those surveyed thought that the lighting was too dim. Professionals were split equally between too dim and adequate (50% each).

Humidity levels

(Q.5) Majority of respondents (56%) felt that the humidity levels were adequate, while only 3% reported too much humidity. A higher number of males (75%) reported the humidity level as adequate as compared to 46% (20) females.
Adequate storage space

(Q.1) On the whole, an equal number of respondents reported that they had sufficient storage space (43%) and did not have sufficient storage space (40%). More males (technical positions) agreed that they had sufficient storage space (79%) as compared to 37% (16) of females. This study found that when storage space increased, the perceived level of job satisfaction increased (.4626, p < .01).

My cubicle is conducive to doing my work to my full potential.

(Q.26) Forty-nine percent (34) of respondents disagreed. Only 33% (23) reported a satisfactory perceived level of satisfaction. There was a significant correlation between perceived level of satisfaction and gender (Cramer’s V-.34728, p < .05). Also, as mentioned in previous points, the level of satisfaction was significantly correlated with sufficient storage space, noise level, proximity from co-workers, job description, overall privacy, and colleagues dropping in for a social chat.

Do you have any dependents

(Q.27-28) Seventy percent (48) of employees did not have any dependents, a higher number than the
researcher expected. But 27% (19) of respondents had infant/s in daycare facilities. An equal number of males and females had infant/s dependents.

The following chapter will interpret the results obtained after the data analysis. Possible solutions are discussed and the scope for further research is explained.
Chapter V
CONCLUSION

The problem of placing people and furniture in space does not exist in a vacuum. If a workspace is reorganized in a way that makes it theoretically efficient, less work will get done if the user hates being there and is eager for an opportunity to leave his/her workspace (Steele, 1973). Most workplace design is often thought of as a programming problem: how to get a certain number of people in a certain amount of space (Steele, 1986). Though the open-office space plan was designed as a solution to the problem of less space, results of various studies clearly show that it can instead lead to newer problems.

Results of this study produced some very interesting findings with regard to the particular organization under study. A distinct lack of conversational privacy is noticed. An overwhelming 93% of respondents say that they have difficulty in discussing confidential matters due to the open-office space plan. The employees clearly lack three types of privacy (communication, concentration and contemplation).

When noise level decreased, the level of job...
satisfaction and overall privacy increased. In fact, a statement by Becker (1981), complements this finding, "employees who use open offices have been proved to be affected by perceived increases in noise level, visual distractions, and an accompanying loss of privacy, that they have reported a loss of efficiency." Steele (1986) also states that variables of physical settings such as noise and interruptions by passers-by can have a key impact on the communication process. According to him, these variables are the most obvious set of features that impact human energy and psychology (Steele, 1986). Audio distractions were highly rated (93%), of which telephone conversations were labelled as most distracting, and also as greatly affecting the perceived levels of privacy.

Though the general objective or the theory of the open-office space plan was to assist in communication and interaction among employees, it was also supposed to simultaneously increase satisfaction and motivation (Becker, 1981). The findings of this study contradict the general objective. As according to the results, too much interaction, distraction and communication with colleagues results in a decreased perceived level of communication privacy and job satisfaction. Most of the employees describe their job as requiring deep concentration and thought--indicating that for employees to have an increased level of job satisfaction, a more conducive work environment
is necessary. Many respondents also think that they are too close to co-workers, which affects the perceived levels of privacy. The low level of overall privacy, then, affects the perceived level of job satisfaction.

Secretaries complain the most about having no privacy, which leads the researcher to support the solution suggested by Mehrabian (1976, p.145), that lower-echelon employees who perform loaded tasks be assigned offices with doors for increased privacy. Respondents report not having sufficient storage space, but more females think that they have insufficient storage space as compared to men.

To conclude, the researcher did find that micro-environmental space, or the physical environment in an open-office space plan where one works, affects perceived levels of communication and job satisfaction. Based on the findings of this systematic inquiry, the researcher developed a model Communication as threading tool for various components of Micro-Environmental Space leading to Job Satisfaction (Figure 4), which is an extension of the model by Sundstrom (1986). As depicted in this model, micro-environmental space, or the physical-environment in which one works, not only affects perceived levels of job satisfaction but also affects intrapersonal and interpersonal communication. One should also keep in mind that this is a cyclic process, and every three to four years feedback from employees should be analyzed to make any
Fig. 4. Communication as a Threading Tool for various components of Micro-Environmental Space leading to Job Satisfaction.
future required changes.

The results suggest conclusion by weighing two feasible options to the issue of micro-environmental space and its effect on perceived levels of communication and job satisfaction:

THE FIRST OPTION

Of the 103 cubicles in the Worldwide Customer Service Department, 23 were noted as being unoccupied. These empty cubicles can prove to be an excellent and cost-efficient solution to the declining level of communication and job satisfaction. Based on the findings of this study, the researcher strongly recommends that the partitions of the empty cubicles should be removed. The available empty space should be converted into a common lounge area or gathering room in the middle of the cluster of cubicles. Such an arrangement in an open-office environment has been proven to promote communication and socialization (Mehrabian, 1976).

A gathering room within the department can be of more use to the employees as compared to the breakroom. Also the current location of the breakroom does not really serve the purpose for the employees of the Worldwide Customer Service Department, as it is too far from the department. The breakroom had not been well-designed and did not serve its purpose. Not many employees visited the breakroom for any other reason than to obtain a can of soda, which the
researcher noted while conducting the questionnaire survey.

According to Steele (1973), office layouts sometimes lack community areas serving as gathering points and should contain the following physical properties: a) It should be central - people would naturally pass through it on way to other places, b) There should be a place to sit and rest comfortably, c) Persons need to be able to stop there and converse or watch others without blocking the flow of vehicular or foot traffic by their stopping.

In fact, the ideal characteristics of a gathering room include convenient access to workspaces and comfortable setting for conversation (Sundstrom, 1986). Such a gathering room should solve the current problem of lack in conversational privacy, distractions in the cubicles, and colleagues dropping in for a social chat. Perhaps what is currently happening is that one employee wants to take a break, but as he/she has no where to go for a "time-out," they go to another colleague's cubicle to chat. The end result is a "Domino Effect."

Evidence is also available to show that involving employees in decisions about office design leads to greater satisfaction with the work environment, greater job efficiency, or both (Sundstrom, 1986). Thus, the researcher suggests that employees should participate in the designing aspect of the gathering room and assemble as per their requirements and needs to promote self-satisfaction. The
management could involve the employees by distributing a survey or having focus-group sessions, and asking the user (employees) to participate, in architectural terms--known as "participatory design."

The levels of communication privacy and job satisfaction can also be increased by changing the physical characteristics of the cubicles such as carpeted floor and a ceiling with good sound absorption qualities (Pile, 1984). Without permanent walls, near conversations can become distracting, leading to loss of privacy. Pile (1984) suggests that the partition panels should minimize the transmission of sound. Because partitions do not extend from floor to the ceiling, they can only slightly retard sound. If the surfaces of furniture and walls are hard, reflections of both noise and light are increased (Steele, 1986). In an effort to increase architectural and psychological privacy in an open-space office, some employees place plants, pictures, certificates, etc., on the unwanted space above partitions. Further solutions to this problem should be forwarded to the Facilities Management Department for additional expert input.

THE SECOND OPTION:

After analyzing the results of the survey, the researcher saw no extraordinary results to suggest telecommuting as the most effective solution to the
inefficient open-office space plan. Seventy percent of the employees surveyed do not have dependents at home, thus work-family problems do not seem to be a significant matter.

On the other hand, telecommuting could be a feasible option to employees as most of them also report using just basic office equipment such as copy machines, faxes, telephones and computers, which due to the increasing competition in the telecommunications industry can be quite affordable as well as better quality. ISDN (Integrated Services Digital Network) has contributed a great deal in turning the possibility of telecommuting into reality; the delivery of image documents from a central site to a remote site is now simple and inexpensive. Thus, if and when difficulties arise, it is up to the supervisor's or manager's discretion to permit the employee to telecommute. No data were found to suggest that females be granted special permission to telecommute as compared to males. Since the employees of the Worldwide Customer Service Department are extremely professional and well-educated they can be responsible enough to work from home and still maintain a high level of productivity. Supervisors/managers must have great trust and confidence in the employee for telecommuting to be successful.

There exists tremendous scope for further research in the field of micro-environmental space in the open-office space setting. Due to the legal limitations posed on this
study, research could not be conducted between various departments of the organization. A larger point of view and greater number of respondents between various departments and different job positions may reveal some interesting issues not revealed in this study. This thesis could be considered as a good pilot study for further research in micro-environmental space in an open-office.
APPENDIX A
QUESTIONNAIRE SURVEY FORM
Dear Sir/Madam:

This survey is being conducted in partial fulfillment for my Master's thesis, regarding communication patterns. Your honest response to the following questions is greatly appreciated.

Please mail the completed questionnaire in the addressed, stamped envelope provided. All information will be confidential. This survey is made possible due to the generous assistance of Len Piechowski, and is meant for academic purposes only.

Thank you for your participation.

Ms. Aparna S. Bulusu
(Graduate Student)

Dr. Carl Kell
(Major Advisor)
1) My cubicle adequately provides storage space. (Check only one.)
   ___ Strongly Agree
   ___ Agree
   ___ Unsure
   ___ Disagree
   ___ Strongly Disagree

In general, I find my cubicle is:
*For example - Too dull _____: _____: _____: _____: _____: _____ Too bright
  1st blank - Too dull, 2nd blank - Dull, 3rd blank - Slightly dull, 4th blank - Unsure,
  5th blank - Slightly bright, 6th blank - Bright, 7th blank - Too bright*

2) Quiet _____: _____: _____: _____: _____: _____: _____ Noisy

3) Far from _____: _____: _____: _____: _____: _____: _____ Close to co-workers
   ___: _____: _____: _____: _____: _____: _____ Close to co-workers

4) Light is _____: _____: _____: _____: _____: _____: _____ Light is too bright
   ___: _____: _____: _____: _____: _____: _____ Light is too dim

5) Too humid _____: _____: _____: _____: _____: _____: _____ Too dry

6) I find the floorplan easy to follow. (Check only one.)
   ___ Strongly Agree
   ___ Agree
   ___ Unsure
   ___ Disagree
   ___ Strongly Disagree

7) My cubicle makes discussing confidential matters difficult. (Check only one.)
   ___ Strongly Agree
   ___ Agree
   ___ Unsure
   ___ Disagree
   ___ Strongly Disagree
8) My job requires *(Check only one).*
   ___ deep concentration and thought to perform well
   ___ a busy and stimulating environment to perform well

9) How often do you get electrostatic shocks in the office? *(Check only one.)*
   ___ Frequently
   ___ Occasionally
   ___ Rarely
   ___ Never

10) I have sufficient overall privacy. *(Check only one.)*
    ___ Strongly Agree
    ___ Agree
    ___ Unsure
    ___ Disagree
    ___ Strongly Disagree

During a normal workday, I sometimes get distracted by: *(Check all that apply.)*
11) ___ Others talking
12) ___ Colleagues dropping in for a chat
13) ___ Cross-talk over partitions
14) ___ Telephone conversations
15) ___ Telephone rings
    ___ Others. Please specify

16) How much time a day, does someone else come to your cubicle for a social chat? *(Check only one.)*
    ___ less than 15 min.
    ___ 16-30 min.
    ___ 31-45 min.
    ___ 45-60 min.
    ___ More than 1 hour.
I use the following equipment on a regular basis at work. (Check all that apply).

17) ___ Telephone
18) ___ Fax
19) ___ Typewriter
20) ___ Computer
21) ___ Laser Printer
22) ___ Video equipment
23) ___ Television
24) ___ Modem
25) ___ Copy machine
   ___ Others. Please specify ________________________________

26) My cubicle is conducive to doing my work to my full potential. (Check only one.)
   ___ Strongly Agree
   ___ Agree
   ___ Unsure
   ___ Disagree
   ___ Strongly Disagree

27) Do you have any dependents at home?
   ___ Infant/s
   ___ Elderly
   ___ Infant/s & Elderly
   ___ None. If you have no dependents, please skip to Question # 28.

28) If your response to Question # 12 was YES, indicate the type of arrangements you have made for their care while you are at work.
   ___ Daycare
   ___ Babysitter
   ___ Friends/Relatives
   ___ Other. Please specify ________________________________
   ___ None

29) Sex:
   ___ Male ___ Female
30) I consider my work to be: (Check only one.)

- Secretarial
- Administrative
- Supervisory
- Technical
- Professional
- Managerial
- Other. Please specify ________________

YOU HAVE COMPLETED THE QUESTIONNAIRE. THANK YOU FOR YOUR PARTICIPATION. PLEASE PUT THE COMPLETED QUESTIONNAIRE IN THE ADDRESSED, STAMPED ENVELOPE AND MAIL.
APPENDIX B
QUESTIONNAIRE THANK YOU/REMINDER FORM
Thank you for mailing back the completed survey for my Master's Thesis.

If you have not yet picked/ filled/ mailed one, PLEASE do so.

Questionnaire Surveys are available in the Break Room.
YOUR PARTICIPATION IS GREATLY APPRECIATED.

THANK YOU

MS. APARNA BULUSU


