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USERS' PRIORITIES:
ACTIVITIES AND ENVIRONMENTAL FACTORS
IN THE HOSPITAL OUTPATIENT WAITING ROOM

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USERS' PRIORITIES: ACTIVITIES AND ENVIRONMENTAL FACTORS IN THE HOSPITAL OUTPATIENT WAITING ROOM

By

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ABSTRACT

USERS' PRIORITIES:
ACTIVITIES AND ENVIRONMENTAL FACTORS
IN THE HOSPITAL OUTPATIENT WAITING ROOM

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The purpose of this study is to identify user preferred activities and priorities and levels of user satisfaction within the environmental factors including: temperature, lighting, noise, furniture and equipment, location/access, view and privacy, to develop design considerations for the hospital outpatient waiting room. The study of the outpatient hospital waiting rooms used questionnaires administered to 154 participants in two waiting rooms in Sparrow Health System. Data were analyzed using both descriptive and inferential statistics.

The results of this study found the following: 1) reading was the most preferred activity among waiting room users, 2) patients and companions prefer the same activities while waiting in the waiting room, 3) waiting room users found many of the environmental factors to be of equally high importance, including temperature, location, access, noise, lighting, furniture and equipment, 4) users were most satisfied with the location and accessibility, temperature and lighting of the waiting rooms. This study also discusses the implications of the results which could be beneficial to professionals including: interior designers, facilities managers, healthcare providers and educators.

Dedication

This thesis is dedicated to all my loved ones that are crazy enough
to put up with and take care of me, no matter what it takes.
I could not have made it without you, thank you.

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Chapter I: Introduction

Statement of Problem

Almost 1.7 trillion dollars were spent on healthcare in the year 2003 alone and healthcare costs continue to the rise (Appleby, 2004). In addition, a great deal of construction and growth is expected, in the near future, of the healthcare environment (Hospital Construction, 2002). With baby boomers placing greater demands and higher expectations on healthcare (Capital Spending in Healthcare, 2004; Levin, 2002), hospitals are finding outpatient healthcare to be a highly cost efficient method of treating patients. This all leads to the fact that further research could be used to optimize within outpatient healthcare. This study of hospital outpatient waiting rooms and the users' perception of the environment should aid in creating environments that promote positive user attitudes within the hospital waiting room.

A patient is sitting and waiting, staring into space, watching the people come and go, hoping that their name is the next to be called. Waiting for a doctor's appointment in the hospital waiting room is probably not the most pleasant thing they have done with their day. The wait does not have to be long, in order for it to be uncomfortable. So, this time they have brought a friend or family member to wait with them. Together they both try to fight off the boredom and anxiety. However, everyone seems to be able to hear their conversation and the looming awkwardness quickly silences the two of them. Now the patient and their companion sit staring at others in the room who seem equally irritated that every five minutes feels like an hour as the stress of the appointment builds. Along with boredom, dissatisfaction with conditions, such as temperature or lighting, in the environment itself can also affect the users' disposition. However, the hospital

outpatient waiting room is not always this unpleasant. Some waiting rooms are very relaxing and comfortable. So what makes one waiting room more stressful than another?

The hospital outpatient waiting room intended for patients who will not be staying over night, and will be waiting a shorter period time for an appointment in which a medical examination, treatment or consultation will take place (Deasy, 1985). Some appointments may be booked in advance; others are reserved for walk-in patients. In general, the average waiting time can range depending on the individual waiting rooms. Furthermore, the design of the waiting room may vary in layout, in interior elements it contains, and in activities it supports.

The patient is the first and most obvious user of the waiting room. However, the patient may bring a companion who could possibly be a family member or friend. A patient may decide to bring more than one companion. These companions should also be considered as users of the waiting room and therefore incorporated into considerations for the waiting room design. The patients' companions help in many ways such as a means of comfort, encouragement, support and entertainment, which potentially can help reduce stress (Schilling, L., Scatena, L., Steiner, J., Albertson, G., Lin, C., Cyran, L., Ware, L. & Anderson, R., 2002). Companions are important users to consider due to the fact that they may spend more time in the waiting room than the patient. Often companions' opinions are later considered by patients when assessing quality of healthcare (Tansik and Routhieaux, 1999).

The function of the hospital outpatient waiting room should be considered. Support for user activities should be provided within the space while the patient and the companion are waiting. For this type of environment there is a lack of research on which

activities are preferred by the users. Furthermore, activities preferred may have indicated design implications. For example, if it was found that users prefer to do paperwork while waiting, designers may try to accommodate this activity by providing many task chairs at small tables and task lighting. On the other hand, if watching television is preferred, the design of the waiting room may include lounge chairs oriented toward televisions, and low levels of light may be more appropriate. Giving researchers a clearer understanding of which studies should be given higher priority.

There is also a lack of research of environmental priorities and needs of the user within a hospital outpatient waiting room. Through research, interior designers and other professionals will be able to have a clearer understanding of which environmental factors to focus upon within the design of hospital outpatient waiting rooms. For example, if it is found that privacy is more important to users than the furniture used in a waiting room, designers may spend more time determining which waiting room layout will provide the type of privacy users require, rather than what type of furniture to specify. Along with understanding which environmental factor is of the highest priority, it is also important to find out users' perception of the current waiting room's environmental factors. In the past, it has been found that users are more likely to rate an environmental factor as a higher priority, when not satisfied with that factor within the current environment that they are in. Therefore, deficiencies within the waiting room may be found to influence the feelings toward importance of given factors (Farrenkopf and Roth, 1980). It is therefore important to measure and record these factors when conducting environmental research.

Currently, due to the lack of research on environmental factors and user activities within the waiting room environment, users' expectations, goals and satisfaction levels may not be met. This will then, potentially, lead to further stress for the user, who may already be finding themselves in a stressful situation. Stress, which if not prevented, may lead users to respond physiologically and or psychologically; enacting coping mechanisms to deal with the poor conditions. This study may provide information for designers of waiting rooms that will aid in creating designs and waiting room environments that suit users' preferences and help accomplish behavior goals. In doing so, the waiting room environment should induce less stress to the user.

Many healthcare facilities conduct patient satisfaction surveys. These, sometimes nonscientific studies consist of questionnaires which generally cover a number of topics ranging from cleanliness to how well the patients were treated by the staff, to time they spent waiting in the waiting room (Strasser & Davis, 1991). Hospital patient satisfaction surveys are generally tools to assist in continuous service quality improvements. These surveys are, for the most part, very specific to the hospital in question, and unfortunately, cannot be generalized for other establishments.

Designers may also conduct Post Occupancy Evaluation or similar studies, in which a specific area within a healthcare facility, after it has been designed, built and put to use, is studied. These studies help identify any successes or shortcomings within the built environment in question. These studies can generally be very useful for future modifications of that explicit space, but overall can be hard to generalize for other similar spaces, because they are so specific. The findings of this type of study may not apply to other waiting rooms. Kaplan (1983) found this to be true for many designed

environments. He noted that previous studies focused on an environment and level of compatibility with its users, relative to that specific use only. Kaplan suggested that research should focus on common environmental qualities that users require from a space in general, making it applicable to other similar environments.

Purpose of Study

The main purpose of this study was to identify user preferred activities and environmental priorities and needs in order to develop design guidelines for the hospital outpatient waiting room. The objectives of this study were:

1. To identify users' preferred activities within the hospital outpatient waiting room.
2. To identify and compare the preferred activities between patients and companions within the hospital outpatient waiting room.
3. To identify users' perceptions of importance in environmental factors within the hospital outpatient waiting room.
4. To identify and access satisfaction levels of users in relation to environmental factors within the hospital outpatient waiting room.
5. To develop design recommendations for the hospital outpatient waiting room.

Research Hypotheses

In order to accomplish the objectives of this study the following research hypotheses were tested:

Hypothesis 1. While waiting in the hospital outpatient waiting room, the users most preferred activity will be:

a. Watching television.

b. Sitting and looking at things.

c. Listening to music.

d. Talking.

e. Thinking, praying or meditating.

f. Writing or doing paperwork.

g. Working on the computer

h. Reading.

i. Eating/ drinking.

j. Sleeping.

k. Playing games.

Hypothesis 2. Preferences of users' activities will be different between patients and companions in the hospital outpatient waiting room.

Hypothesis 3. Users will find the most important environmental factor in hospital outpatient waiting rooms to be:

a. Temperature.

b. Lighting.

c. Noise.

d. Equipment and furniture.

e. Location/ access.

f. View.

g. Privacy.

Hypothesis 4. The environmental factor that users are the most satisfied with in the hospital outpatient waiting room will be:

a. Temperature.

b. Lighting.

c. Noise.

d. Equipment and furniture.

e. Location/ access.

f. View.

g. Privacy.

Limitations

The following are some limitations of this study:

1. Although age, culture and other personal background were not the focus of this study, they may have an affect on users' preferred activities and perceptions of the environmental factors and should be considered in future studies.
2. This sample was limited to the users who were waiting in the outpatient waiting room in a local hospital of Lansing, Michigan.
3. This study was limited to two different waiting room layouts. However, there are many different types and layouts of waiting rooms within a hospital.
4. For the respondent in the waiting room, their past experiences in the waiting room environment may be a variable that could impact the

preferred activities and perception of the environmental factors, but past experiences is not a focus of this study.

5. Stress and health conditions of the users may affect users experience and response at the time of data collection.
6. This study was limited to asking primarily close ended questions about eleven activities and seven environmental factors through use of a questionnaire.

Assumptions

The following assumptions were made in respect to this study:

1. Respondents were not required to participate in the study, increasing subjects' motivation to complete the questionnaire thoughtfully and accurately.
2. Similar waiting room conditions exist to which the findings may be applied.
3. The outpatient waiting rooms used in this study were assumed to be representative of typical outpatient waiting room in a hospital.
4. The instrument used to collect data, a self-questionnaire, accurately measured the opinions of the respondents about the activities preferred and the environmental factors.

Operational Definitions

Activity

The act a patient or patient companion may choose to take part in while waiting in the waiting room will be referred to as an activity. For the purpose of this study, eleven

classifications of activities have been identified through observation and literature review. They are as follows: watching television, sitting and looking at things, listening to music, talking, thinking/ praying/ meditating, writing/ doing paperwork, reading, eating/ drinking, sleeping and playing games (Tivorsak, Britto, Klostermann, Nebrig & Slap, 2004).

Environmental factors

The individual characteristics of the waiting room as a built setting are referred to as environmental factors. This study will explain the importance of environmental factors to users (also referred to as EFI) and users' satisfaction with environmental factors (also referred to as EFS). Through literature review and observation seven dimensions of environmental factors were identified (Farrenkopf & Roth, 1980). For this study of the hospital outpatient waiting rooms, environmental factors used were the following:

1. Equipment and Furniture: the items in a waiting room that are used to carry out a purpose. For this study, equipment may be television, vending machines and computers. Furniture is considered being almost essential for any activity to take place. Tables and chairs are two types of furniture commonly used in the waiting room (Pile, 1995).
2. Lighting: the appearance, source and characteristics of the light within the hospital outpatient waiting room measured by units of illuminance called footcandles (Dechiara, J., Panero, J., Zelnik, M., 2001).

3. Location/ Access: the proximity of the waiting room in relation to the reception area, the bathroom, or patient treatment/ examination rooms.
4. Noise: any sound that can be heard with in the waiting room. Possible sources of noise within the waiting room may include voices, television or music. Sound is measured in decibels (dB) (Dechiara, J. et al, 2001).
5. Privacy: the access that a patient or patient companion has to others in the waiting room. This includes visual, auditory and physical access. Privacy, for this study's purpose, is also closely related to crowding and personal space (Gifford, 1997).
6. Temperature: the relative heat or coldness of the hospital outpatient waiting room measured in degrees of Fahrenheit.
7. View: the scene or something to observe from inside or looking out of the waiting room. For the purpose of this study, view as an environmental factor, is something that the outpatient or patient's companion is capable of seeing, for instance the outside landscape observed through a window.

Hospital Outpatient Waiting Room

The area used by patients and people accompanying patients while they wait for a scheduled or walk-in doctor's appointment, which could be for a variety of medical reasons, is referred to as the hospital outpatient waiting room. The waiting room can vary

in size and layout. The waiting period is short term, in which user may be waiting anywhere from minutes to hours (Deasy, 1985).

Outpatient and Companion

Any person receiving treatment at a hospital without being admitted as a patient is referred to as an outpatient. All patients referred to in this study are outpatients waiting in the hospital waiting room to be treated. A person who accompanies an outpatient during the time spent in the hospital waiting room is referred to as a patient companion. Outpatients and companions are the two user types which were studied in the waiting room.

Perception

A mental impression that a person develops about an object, item, or group of things, is a perception. For the purpose of this study, perception refers to the mental impression of importance developed by patient or patient companion in relevance to the hospital waiting room's environmental factors.

Satisfaction

The degree to which a patient or patient's companion is able to accomplish a self determined goal is referred to as satisfaction. For this study, environmental factors and the waiting room are the two variables which were researched in relation to patient and patient companion satisfaction.

Chapter II: Review of Literature

Introduction

This chapter discusses studies that have taken place prior to the completion of this research pertaining to: healthcare facility and waiting room design, environmental factors, user behavior, and the overall relationship between the user and design.

Healthcare Facilities and Waiting Room Design

There are many studies on hospital healthcare, and a number of studies pertaining to the healthcare facility itself. An article entitled, *Design based on the Evidence*, by Levin (2002), the Vice-President of the Center of Health Design explains that like medicine, design should be evidence based, listing: 1) Access, 2) Control, 3) Positive Distraction, 4) Social Support, 5) Environmental stressors as the five areas important to healthcare design research. All of these areas of research may be applied to the design of the waiting room and are touched on in one way or another in this study. The following are relevant studies pertaining to healthcare facility design, addressing issues that affect both the facilities and their users.

A study, by PricewaterhouseCooper (Hospital Construction 2002), surveyed more than 650 people including top health care executives, health plans, physician groups, medical vendors, and employers and health government officials. In this study, it was concluded among other things that hospitals need to start reassessing their old buildings before they start building new ones. The study indicated that newly constructed hospitals need to pay attention to issues not previously addressed, such as privacy, flexibility and zoning. Furthermore, it is being recognized that patients' families must be taken into greater consideration, incorporating larger waiting rooms into hospitals when

constructing or renovating. These changes in healthcare are thought to be important in order to improve the quality of care and increase retention of professional staff.

Additionally, in a qualitative study by Jacqueline Azzarto (1994), it was found that both patients and staff work better in family-like settings. This was determined after observing an inner-city community health center. Another study, by Ulrich (1984), matching similar type patients, found that when patients are given a view of trees and landscaping, they are likely to have a quicker recovery time and use less pain reliever, as opposed to patients who view a brick wall.

Most hospitals do their own research through Patient Satisfaction Surveys. This may be one reason why there is very little research on waiting rooms that has been published. Although the studies seem to work well for the hospital in which they were conducted, it often cannot be used by others outside that facility. Furthermore, much of this research is used to identify operational or procedural problems that may exist within a specific area, rather than looking at overall environmental features. As such, the studies are of little use for a designer working on a new facility. The following are studies of elements of the waiting room environment which have been published.

A study by Arneill and Devlin (2002) found that a positive appearance within a waiting room is important when trying to give the feel of quality of care being provided. In this study, updated furniture, quality lighting, and enhanced aesthetics incorporating art work was used to give a positive perception of the environment. The study showed that the waiting rooms for female physicians where perceived to have a higher quality environment. The female physicians were also perceived as providing a better quality of care. Pruyn and Smidts (1998) studied the effects of the aesthetics and distraction within

the waiting environment in the marketing and service realm. They concluded that the aesthetics of the environment had more of a positive effect than shortening the time of waiting.

In one study by Tivosak et al (2004), adolescents' attitudes and preferences towards the waiting room were explored. The study sampled 54 adolescents ranging in age from 11 to 19 years of age. The participants were separated into focus groups where they were asked to talk about how they would design the doctor's office. One topic that was repeatedly expressed was the quality of the waiting experience. The waiting rooms were not only lacking attractiveness, but subjects also found that waiting times were too long. More importantly, subjects felt that it was not the lack of activities that was the problem but rather the lack of interesting activities, entertainment or distractions while waiting that lead to dissatisfaction and boredom.

Research by Tansik and Routhieaux (1999) was designed to determine if slow relaxing music in the surgery waiting room helped reduce stress and anxiety for people waiting for patients in surgery, and if that music would give a better perception of the hospital's quality of service. Through use of a questionnaire, this study found that people did, in fact, perceive reduced stress and increased relaxation when music was played, as opposed to no music. However, the music did not make an impact on the user's evaluation of the quality of the hospital's service. Furthermore, this study gives a reminder that there are other customers in a hospital other than the patient. The patients' companions' opinions are also important. This customer, possibly a family member or friend of the patient, may be paying the medical bills and returning for other services. It

was noted that companions are often under less stress and are able to better evaluate the hospital environment (Tansik and Routhieaux, 1999).

In a study by Schilling et al. (2002), the presence and importance of the patients' companions in the waiting room, as well as in the examination room was analyzed. The study found that this group of users were useful not only for transportation, but also as a source of emotional support and companionship. Findings showed that both physicians and patients agreed that companions are helpful during the visit. Hence, it is important to get feedback on the waiting room environment from companions, as well as patients.

Environmental Factors

When designing a space it is important to identify needs and priorities of the user for the space. Although there are limited studies available on the waiting room environment in general, there are quite a few on the office environment. In a study, by Farrenkopf and Roth (1980), users were interviewed and asked to rank office environment dimensions (or environmental factors) by order of importance and also identify satisfaction levels. The dimensions identified in the study where presented in an eight-item environmental priorities rank-order list and included: 1) space, 2) location/access to people and resources, 3) aesthetics, 4) privacy and quiet, 5) heating/ ventilation/air conditioning (HVAC), 6) lighting, 7) equipment and furniture, 8) windows and view. These eight environmental dimensions were determined in previous studies. The study, of 71 faculty members, found privacy to be one of the most important dimensions of the office environment, second only to location. The study further concluded that the more inadequate the office (in relation to environmental factors), the higher the users rated importance of the environmental factor.

In a study by Archea (1977), the relationship between the physical environment and privacy was explored. The study found that in order to maintain or attain a behavior (in relation to privacy) one must have control over the physical environment. Archea expresses that the physical environment is an independent variable that must be addressed when accessing issues of privacy. Archea concludes that the environment must be accurately studied and documented with the same level of intensity as that used to measure user behavior in order to understand the relationship between the two.

Sundstrom, Town, Brown, Forman, McGee (1982) found that a person's perception of privacy depended upon the type of activity and control over their contact with others. In this study a questionnaire, completed by 154 office employees, was used to determine factors that affected perceptions of privacy. Based on a seven point scale, participants rated job complexity, job satisfaction, satisfaction with workspace, privacy, proximity, crowding, noise, distraction, and pleasant place. Along with the questionnaire, participants' offices were assessed to establish space characteristics such as square footage and amount of enclosure. The results found that the amount of physical enclosure a participant had in their workspace related directly to how they rated privacy.

In another office environment study, Sundstrom, Herbert, & Brown (1982) used a questionnaire to find employee's satisfaction levels with communication, distraction and privacy in the open-plan office environment. The study found, among other things, that although visual privacy presented a problem in achieving satisfaction, noise also played a very compelling negative role; it explained that without this, confidentiality in conversation is lost. Researchers concluded that acoustics is an important factor when designing for privacy within office environments.

These studies concentrate largely on the relationship that exists between the environmental factors (in this case privacy), the user and the environment. These studies would not be important, if Farrenkopf and Roth (1980) had not proven the importance of privacy to the user in the first place. It is for this reason a study is necessary to find out what environmental factors are important to waiting room users.

User Behavior

There are many views on the combined factors of the environment, the user, and behavior and their relationships. The following are past studies, models and theories used to develop this study.

Zimring (1981) explored, "several areas where the designed environment interacts with important behavior processes, and consider[ed] these interactions from perspective of stress imposed on the individual," (p.145). He viewed the designed environment as an environment in which the physical elements interact with individual goals and needs. Furthermore, Zimring found stress to be a result of interactions of person and environment in which the individual's needs and the environmental attributes do not fit. Zimring found that in order to create a fit, the environment's design must be conducive to the individual's social, cognitive and behavior goals. Overall, the findings of Zimring support the idea that it is important for the design of the environment to fit with goals of the individual users in order to avoid stress.

Kaplan (1983) proposed a new approach for researchers when studying user and environment relationship which would aid in the understanding and creating of environments that are appropriate for people. He had found that previous studies focused on an environment and level of compatibility with its users, relative to that specific

location only. Kaplan suggested that research should focus on finding common environmental qualities that users require from that type of space in general, making it applicable to similar environment's designs. Furthermore, focus should be placed on, "behavior that is either required or actively discouraged in a particular setting," (p.313). Overall, the important aspect to keep in mind while researching would be to figure out the characteristics that people want and need from a type of environment, rather than what they get from one specific environment.

Based on the connection of the environment (the physical setting) and individuals, environmental psychology aims to improve building design in order to improve the relationship between the building and its users. This study, of the outpatient waiting room activities and environmental factors, references theories from environmental psychology in attempts to better understand the waiting room environment and strengthen its relationship with the users. This is a relatively different and new type of interior environment to be studied, due to the fact that the user is in the room for a relatively short amount of time, yet the environment could potentially cause stress to the user. Theory and models, as a source for guidance of research and practice, provide a framework for understanding the sometimes difficult behavior and environment relationship and its problems. The following are theories and models referenced in this study.

Opportunity Structure Model

This study references the Opportunity Structure Model. This model assumes that the environment should be used to accomplish goals (Gifford, 1997). The behavior that the user of the waiting room chooses is based on many inputs. Social-culture background, expectations, emotions, goals and the setting itself will direct the user behavior (Gifford,

1997). It is important to understand the users' goals and intentions, in order to be able to support user behavior and well-being in a positive manner. This study, also, recognized that it is not purely the environmental factors which affect a person's response to an environment. Many factors such as age, sex, social-culture, personality, and perceptions may all affect a person's responses to the environment factors (Gifford, 1997). This is why it is important to understand in what activities a user of a waiting room may want to participate.

Behavior-Setting Theory

One of the theories this research references is the theory of the environment and behavior and environmental psychology known as the Behavior- Setting Theory (Gifford, 1997). This theory is based on the concept that there are consistent patterns of behavior which correspond to a given setting. One assumed behavior pattern which may be found within a waiting room is seat selection. It is because of the Behavior-Setting theory that this study looks to further understand which behaviors correspond with the waiting room. This study looked to see not only what the user commonly does, but what the preferred behavior is, so that future waiting room environments may accommodate that behavior.

Stimulation Theory

Another of the theories this research references is the theory of the environment and behavior and environmental psychology known as the Stimulation Theory (Gifford, 1997). This theory is based on the idea that the physical environment is the supplier of sensory information, such as light and sound, which is fundamental to our wellbeing. Other theoretical models relate to Stimulation theory, which examines the effects of over and under stimulation. It is because of this theory that this study looks to further

understand the environmental factors. By studying the users' satisfaction levels of the environmental factors, this study will begin to develop an understanding of what conditions are acceptable to users.

Conclusion

Throughout the literature review a strong relationship can be found between the user and the environment. Although there is much research to be found on healthcare facilities, the hospital outpatient waiting room is an area that has received very little attention. This writer contends that the environment should be conducive to the user, and therefore understanding the user's behavior, goals and intention should help to develop a positive relationship between the two. Users' activities and environmental factors are two areas which have been studied in other environments such as children's waiting rooms and offices in order to help understand and create a constructive relation; that example is followed here.

Chapter III: Methods

Sample

The quantitative study was conducted using data reported from a questionnaire completed by 154 patients and companions who were randomly selected while in the waiting rooms and who agreed to participate. To help control for the many possible extraneous independent variables, including types of medical treatments, waiting times, locations, interaction between nurses, doctors and patients which could affect the result of the study, measurements for this study were performed in two separate outpatient waiting rooms in Sparrow Health System, during the same time period. The two waiting rooms were chosen due to some of their similarities. The two waiting rooms used in the study both provided a range of services which varied from annual check ups that could be not very stressful to other treatments that were more severe and could be very stressful. Furthermore, they both served a variety of patients of all different ages. Lastly, both waiting rooms provided for the same types of activities and were relatively close in square footage. Furthermore, the two waiting rooms were also chosen due to some of their differences. Waiting room B was built within the last couple of years, where as Waiting A is a considerably older. Furthermore, the two waiting rooms had differences in some of their design features that can be closely related back to a few of this study's environmental factors. For example, the lighting is very different between the two rooms. The difference in this environmental factor may influence the users' responses. Therefore by using two waiting rooms with different lighting, a greater understanding of the relationship between the users' answers and the environment they were in during the time of responding may be developed.

The target population consisted of hospital outpatients and companions waiting in hospital outpatient waiting rooms in Sparrow Health System in Lansing, Michigan. The researcher randomly chose the two outpatient waiting rooms from Sparrow hospitals. Any person that was either a patient or patient companion, and at least eighteen years of age, was permitted to complete the survey, regardless of gender, income or occupational status.

Prior to administration of the questionnaire, Approval was received by Michigan State University's University Committee on Research Involving Human Subjects and Sparrow Health System Institutional Research Review Committee. These two organizations were developed to protect the rights of human subjects. In order to obtain these approvals the cover letter, purpose and methods of study as well as the contents of the questionnaire were reviewed by each group.

The finalized questionnaire was distributed to participants accompanied by a cover letter of consent endorsed with the Sparrow Health Systems Institutional Research Review Committee approval stamp and date. Both the consent letter and the researcher distributing the questionnaires explained the purpose of the survey. They also explained that all responses are confidential and that participation in the questionnaire was voluntary. Furthermore, it was made clear that refusal to participate in the survey or certain questions would not result in any penalty. The recipients by signing and dating the consent form, completing and returning the questionnaire were deemed to agree to participate in the study. Participants were not paid or given any other form of compensation for completing the survey.

The Hospital Facility and Two Waiting Rooms

The two waiting rooms used in this study were part of the Sparrow Health System. The Sparrow Health System, established in 1896, currently has in excess of six thousand employees, who work together to provide healthcare for the mid-Michigan area. Sparrow Health System is located in Ingham County, and the capital city of Michigan, Lansing. Lansing, with a population of 119,128, as of year 2000, consists of approximately 48 percent males and 52 percent females. The population consists approximately of 61 percent White non-Hispanic, 22 percent Black, and 10 percent Hispanic (Lansing, Michigan, 2004). Sparrow hospital serves both inpatient and outpatient hospital-based care. Receiving accreditation by the *Joint Commission on Accreditation of Healthcare Organizations*, Sparrow hospital consists of primary and specialty care facilities, as well as a number of other services and facilities (Sparrow Health Systems, 2004).

Waiting Room A: MRI/X-Ray

Waiting Room A is located in the Sparrow Hospital's Main building on the ground level. Both MRI and X-ray outpatients and patients' companions share this room. Serving two different departments, the waiting room had two separate reception windows adjacent to each other. The patients stand at a small counter and talk to the receptionist through a half open window. Some patients had to fill out paperwork given to them by the receptionist. Clipboards were used for support while writing. The X-Ray department is open twenty-four hours a day, every day of the week. The MRI department opens twenty four hours a day Tuesday through Saturday, 6am to midnight Sunday and Monday. The waiting room serves walk-in patients, patients waiting for appointments,

and persons waiting to pick up x-rays. Patients consisted of both adults and children. The waiting room is approximately 335 square feet. This waiting room had light cream-colored walls and medium and dark tone carpet. The room contains both chairs with and without arms, two side tables and a magazine rack. A television was on in the corner of the room. There is no natural light in the room. The major light source comes from florescent light recessed into the ceiling, and reflected through baffled openings; fixtures were located next to the walls around half of the waiting room. There are also four recessed incandescent lights, two located near the reception windows, and one above each of the two entryways. In general, the average lighting for the waiting room is 13.8 footcandles. See Figure 1 Floor Plan of Waiting Room A for further room details.

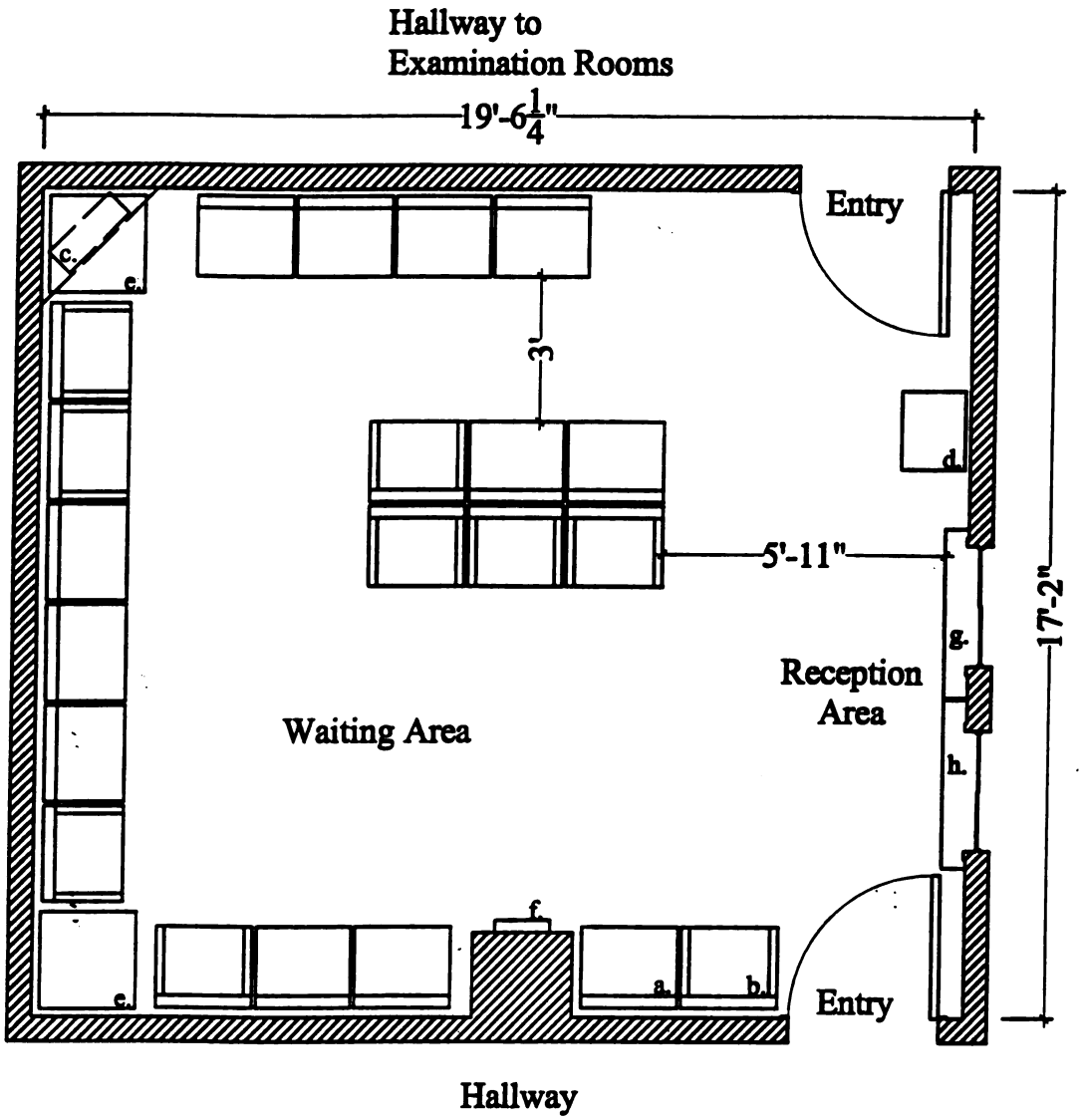

Figure 1. Waiting room A

Scale: No Scale

N

Key

a. Typical chair without arms
b. Typical chair with arms
c. Television: A.F.F. = 68"
d. Trash receptacle
e. Table
f. Magazine rack
g. MRI Reception
h. X-Ray/ Radiology Reception

Waiting Room B: Diagnostic Center

This waiting room is located in the Sparrow Professional building, which is located directly south across Michigan Avenue from the main hospital building on the ground floor. This waiting room opens Monday through Friday, 7am to 7:30 pm. Patients consisted of both adults and children. Waiting Room B is approximately 350 square feet. The waiting room serves walk-in patients and patients waiting for appointments for services including: Diagnostic center, Infusion center, Laboratory, Mammography, Pre operative testing, Pulmonary Function and Radiology/ X-Ray. The reception area of this waiting room has four reception counters, separated by small-half wall partitions, in which patients could talk while sitting at the counter. Receptionists collected information from the patients and entered it directly into the computer system. This waiting room had light cream-colored walls and medium and dark tone carpet. The room contained both chairs with and without arms, a table and a magazine rack. A television was on in the corner of the room, it also had a VCR but this was not on. The primary light source for the room was the natural light coming from the entry and the interior windows near the entry. There are also nine incandescent recessed lights through out the waiting room. In general, the average lighting for the waiting room varies quite a bit depending on the weather and the time of day. See Figure 2 Floor Plan of Waiting Room B for further room details.

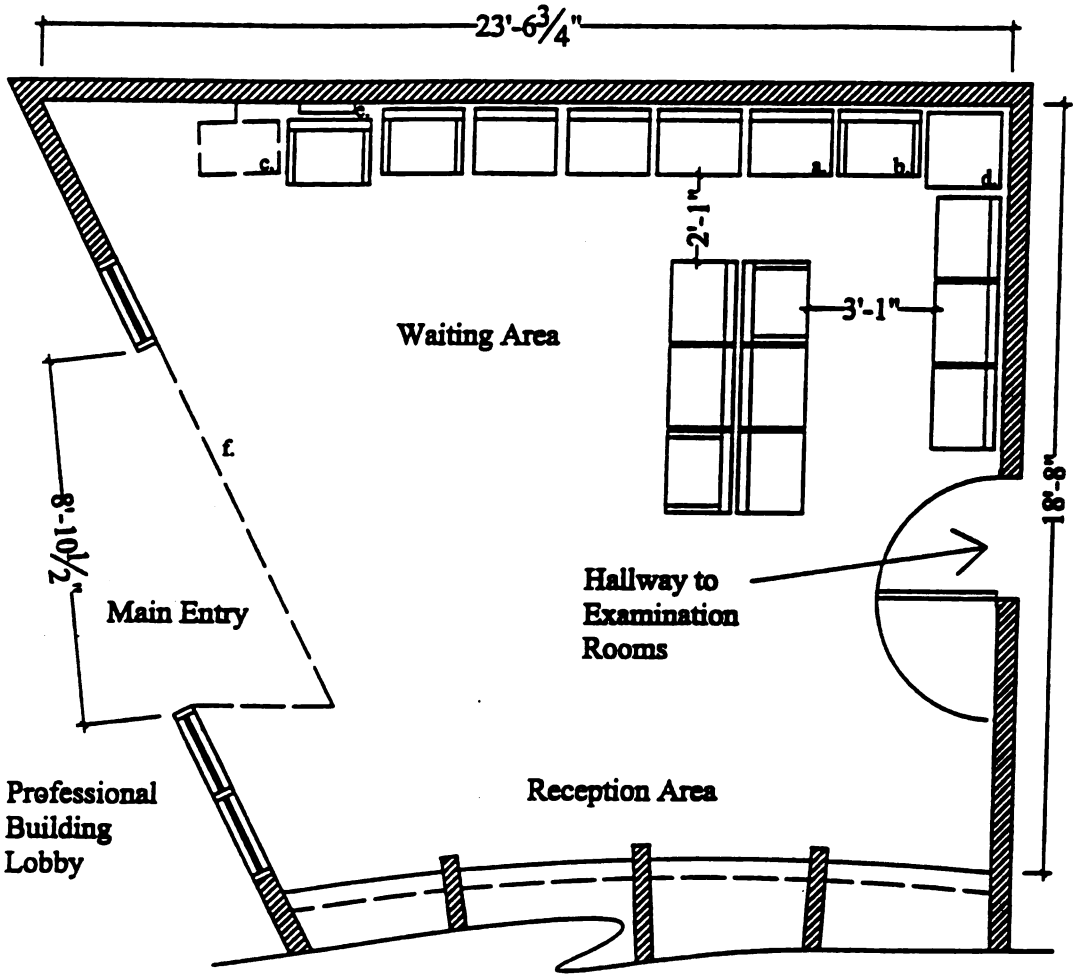

Figure 2: Waiting room B

Scale: No Scale

N

Key

a. Typical chair without arms
b. Typical chair with arms
c. Television with VCR:
A.F.F = 80"
d. Table
e. Magazine rack
f. Lobby tile meets waiting room carpet

Instrumentation

A questionnaire was developed in order to assess the patient and patient's companion's preferences of activities while in the waiting room, as well as, their priorities of environmental factors and degree of satisfaction. The questionnaire can be found in Appendix A.

The first section of the questionnaire contained demographic questions relating to the characteristics of the participant. The questions included: age, gender, whether they were a patient or a patient's companion, race, frequency and time spent in the waiting room and stress levels.

The second section pertained to activity preferences of the participant in the waiting room. Questions were developed by the researcher based on previous similar studies of activity preferences in different fields (Konrad, Kashlak, Yoshioka, Waryszak & Toren, 2001; Sherwood, Story, Neumark-Sztainer, Adkins & Davis, 2003). The seven-point Likert type scale was the primary format for this section of the questionnaire, along with rank order questions. Individual categories of activities were based on research observation and behavior studies of waiting rooms as well as previous studies found in the literature review (Tivorsak et al., 2004).

The third section pertained to the participants' preferences of environmental attributes and overall satisfaction with the waiting room. Environmental Factors and methods chosen for the questionnaire were developed by the researcher based on information found in the literature (Farrenkofp & Roth, 1980; Sherwood, et al., 2003; Tansik & Routhieaux, 1999).

Data Collection

Environmental Conditions, including room temperature, relative humidity, sound and illumination levels were recorded for the hospital outpatient waiting rooms on the day the questionnaire was distributed. A Box Car Pro 4.3 Program was used along with HOBO loggers to measure the temperature and relative humidity. A Mannix sound level meter was used to measure sound. A Sylvania light meter was used to measure the illuminance levels. At this time, floor plans were drafted to demonstrate room dimensions and furniture/equipment arrangement.

The questionnaire was administered to all of the users in the two selected waiting rooms at Sparrow hospital. Overall, participants took approximately 15 minutes to complete the self-administrated questionnaire. The questionnaires were distributed and collected while participants were in the waiting rooms. The questionnaires were distributed in six different time blocks, each consisting of approximately four and half hours. Each day consisted of two time blocks, categorized as either a morning or evening period. The data collection procedures are described below.

A researcher, wearing a nametag, identified herself and distributed the questionnaires along with pens to waiting room users who agreed to participate. After handing the questionnaire to a voluntary participant, the researcher explained the consent form, voluntary participation and that a signature was needed on the consent form in order to complete the questionnaire. The researcher stayed in the room after distributing the questionnaires to answer any questions that the participants had. The consent letter also told the subjects to place the consent form in one box and the questionnaire in another box in order to ensure confidentiality. The consent letter box was labeled

"Consent letters." The other box was labeled "Waiting Room Survey." The two collection boxes were prominently placed by each other in the waiting room. Copies of blank consent forms were available, if a participant would like to have one. Although, the two boxes were present for participant to place their questionnaire in upon completion, the majority of the participants handed their and consent form and questionnaire back to the researcher when finished. When this happened the researcher placed them in the correct boxes.

Data Analysis

During the time of data collection 229 questionnaires were distributed. After all questionnaires were collected back from the participants, they were reviewed for level of completion and validity. Questionnaires with 13 or more incomplete answers were discarded. Furthermore, any questionnaires in which it appeared that the participant did not consider questions seriously were also discarded. For example, questionnaires with the same answer selected for the entire questionnaire, or those who suggested activities such as "oil wrestling" and "drinking beer" as alterative preferred activities were discarded. Therefore, 154 participants' questionnaires were used to analyze the objectives of this study.

All data collected from the questionnaire were tabulated, coded, and statistically analyzed in a manner designed to identify a list of evaluative criteria. Frequencies, percentages and measures of central tendency were calculated for the characteristics of the respondents and their preferences of the activities, importance and satisfaction of environmental factors for the hospital outpatient waiting room environments.

To analyze the statistical significance of preferred activity a paired t-test was used. To find out possible statistical significance of preferred activity between the two different user types (outpatients and companions) a two sample t-test was used. To analyze the statistical significance of users' responses to importance of environmental factors a paired t-test was used. A two sample t-test was used to analyze the statistical significance of the importance of the environmental factors between the two waiting rooms. To find the statistical significance of the satisfaction with environmental factors a paired t-test was used. To analyze the statistical significance of the users satisfaction with environmental factors between the two waiting rooms a two sample t-test was used. P-values equal to or less than 0.05 are considered to show a statistical difference. The more stringent p-value of equal or less than 0.01 was also indicated because of the use of multiple comparisons. (See Appendix C, questions 15 through 22.)

Furthermore, a Pearson Correlation Coefficient was used to calculate correlation between similarly phrased questions of satisfaction with environmental factors to determine the statistical significance and consistency in user responses to temperature, light, noise, equipment/ furniture, privacy and view.

Chapter IV: Results

Sample Characteristics

As seen in Table 1 Demographic Profile of Respondents, the sample consisting of two Sparrow Hospital waiting rooms users (N = 154), 59.01% (n = 91) were patients and 40.91% (n = 63) were companions. Both females (62.33%, n = 96) and males (37.66%, n = 58) participated in the study. Although, over half of the sample was between the ages of thirty and fifty-nine years of age (64.23%, n = 97), the sample also included user ages 18 to 29 (13.91%, n = 21), and age 60 to 100 (21.85%, n = 33). The majority of the sample was Caucasian/ Non-Hispanic (82.24%, n = 125). Other races included within the sample were 7.89% African American/ Non-Hispanic (n = 12), 3.29% Hispanic (n= 5), and the remaining 6.58% consisted of Mexican American, American Indian, Asian American and others that were not included in these first six categories.

Out of ninety-one patients, more than half of the patients did not bring a companion with them (65.93%, n = 60). Patients often only brought one companion with them (72.41%, n = 21). The companion generally was a family member of the patient (87.30%, n = 55).

Participants spent on average less than fifteen minutes (mean = 11.17, n = 143) filling out the questionnaire. The average time participants expected to wait was just under forty-five minutes (mean = 40.97, n= 141). Participants reported experiencing mostly medium to low amounts of stress while in the waiting room (mean = 5.272, n = 154).

Table 1

Demographic Profile of Respondents

Sample Characteristics	n	N*	Count	Percentage (%)
Gender	154	0		
Male			58	37.66
Female			96	62.33
Age (years)	151	3		
18 – 29			21	13.91
30 – 39			24	15.89
40 – 49			46	30.46
50 – 59			27	17.88
60 – 69			15	9.93
70 – 100			18	11.92
Race	152	2		
Caucasian Non-Hispanic			125	82.24
Hispanic			5	3.29
African American Non-Hispanic			12	7.89
Mexican American			2	1.32
American Indian			1	0.66
Asian American			2	1.32
Other			5	3.29

(*table continues*)

Table 1 (*continued*).

Sample Characteristics	n	N*	Count	Percentage (%)
User Type	154	0		
Patient			91	59.09
Patient Companion			63	40.91
Patient brought a companion	91	63		
Yes			31	34.07
No			60	65.93
Number of people patient brought	91	63		
None			62	68.13
1			21	23.08
2			5	5.49
3			2	2.20
more than 3			1	1.10
Companion relationship to patient	163	91		
Family Member			55	87.30
Friend			4	6.35
Other			4	6.35

Table 2

Profile of Respondents: Time and Stress

Sample Characteristics	n	N*	Mean	SD
Time Spent Waiting				
Actual	143	11	11.17 minutes	14.55
User's Expectation of	141	13	40.97 minutes	64.65
Stress*	154	0	5.272	1.796

*Calculated on 7 point likert scale (7 = Hardly any stress, 1 = Very stressed)

Waiting Room Characteristics

General data were collected from the waiting rooms, in order to make conclusions from the sample's answers. Data such as room temperature, relative humidity, sound and levels of illumination were recorded by the reseacher. Both waiting rooms maintained, on average, a temperature of approximately seventy-two degrees Fahrenheit with an average humidity of approximately forty-two percent. See Table 3 Temperature and Relative Humidity during Time of Data Collection for recorded data of temperature and relative humidity of the two waiting rooms.

Table 3

Temperature and Relative Humidity during Time of Data Collection

Day/ Room	Temperature (° F)			Relative Humidity (%)		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean
Monday						
Room A	71.77	72.46	72.15	41.1	44.3	43.4
Room B	70.39	72.46	71.55	36.8	42.0	39.52
Tuesday						
Room A	72.46	72.46	72.46	42.8	44.3	43.4
Room B	72.46	73.15	72.98	40.6	46.7	44.0
Wednesday						
Room A	71.77	72.46	72.12	41.5	43.3	42.5
Room B	71.77	72.46	72.29	39.0	44.0	41.1

Sound levels often varied between the two waiting rooms. Waiting Room A had a tendency to be quieter, with an overall mean of 57.4 decibels, during time surveying was taking place in the room. Waiting Room B had an overall mean of 62.1 decibels. Higher levels in Waiting Room B may be partly attributed to the large open entryway into the main lobby compared to the smaller entryways with doors in Waiting Room A. The overall mean for the sound levels for both rooms is 59.8 decibels. Forty to fifty decibels is considered to be a moderate sound sensation level, whereas sixty to eighty is considered to be loud. With forty decibels being equivalent to face to face conversation, and eighty decibel equivalent to a very loud cocktail party (Dechiara, et al., 2001). See

Table 4 Sound and Illuminance during Time of Data Collection for minimums, maximums and means of sound levels during time of surveying.

There was also a great deal of difference in the levels of illumination found in the two waiting rooms. Waiting Room A averaged about 13.8 footcandles in the space. Without any source of natural light, Waiting Room A lighting remained the same. However, this was not the case for Waiting Room B, which had a great deal of natural light depending on the type of weather and time of day. Levels of illumination varied anywhere from 15 to 80 footcandles during the time of surveying. Twenty footcandles are recommend as a minimum, for a general office reception area, however this is for users who have fairly good eye sight (Dechiara, et al., 2001). Both waiting rooms seemed to have a variety of levels of lighting throughout the room. See Table 4 Sound and Illuminance during Time of Data Collection for recorded minimums, maximums and means levels of illumination recorded during time of surveying.

Table 4

Sound and Illuminance During Time of Data Collection

Day/ Room	Sound (dB)			Illuminance (fc)		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean
Monday						
Room A	42.3	78.2	58.2	3	29	13.8
Room B	43.1	83.3	59.9	28	78	43.3
Tuesday						
Room A	Low	81.8	52.1	3	29	13.8
Room B	45.5	82.1	63.2	15	42	26.7
Wednesday						
Room A	44.2	88.4	62.0	3	29	13.8
Room B	43.0	81.8	63.2	28	80	43.9

Reliability of Measures

Reliability of measurement was not an issue for this study due to the fact that preexisting methods of measuring were used. A check of reliability of raw data entry was done in which ten questionnaires were picked at random using Minitab. Questionnaires 104, 53, 70, 91, 39, 61, 17, 113, 16 and 99 were chosen and reexamined to evaluate the reliability of raw data input. Through reexamination no errors were found.

In addition, a Pearson Correlation Coefficient Test was used to examine the reliability of the participant's answers to satisfaction with environmental factors. The correlation was based on participants' answers to the question: "How do you feel about

the following conditions of the waiting room," for each environmental factor. The first time the question was asked participants chose answers from a 7 point Likert scale based on, "Very Dissatisfied" to "Very Satisfied." In the next section, participants were asked the same question but they must chose an answer from a 7 point Likert scale based on, "Inadequate" to "Adequate." Correlations were all significant and achieved statistically significant positive correlation. Therefore, reliability of participant responses was consistent. See Table 5 Pearson Correlation Coefficient for User's Satisfaction with Environmental Factors for calculated values.

Table 5

*Pearson Correlation Coefficient for User's Satisfaction with Environmental Factors***

Environmental Factor	Correlation	P-value
Temperature	0.456	0.000*
Lighting	0.404	0.000*
Noise	0.596	0.000*
Equipment/ Furniture	0.467	0.000*
Privacy: Auditory Distraction	0.401	0.000*
View	0.728	0.000*

* P-value $\leq$ 0.01

**Table based on questions 15 through 22 of Questionnaire. Answers were based on a 7 point Likert scale: 7 = Very Satisfied to 1 = Very Dissatisfied, 2) 7 point Likert scale: 7 = Adequate to 1= Inadequate, (See Appendix C.)

Hypotheses Findings

The following are the results based on respondents' answers from the questionnaire. The data collected is presented according to the hypothesis for which the questions were intended to test.

Hypothesis 1. While waiting in the hospital outpatient waiting room, the users most preferred activity will be:

a. Watching television.

b. Sitting and looking at things.

c. Listening to music.

d. Talking.

e. Thinking, praying or meditating.

f. Writing or doing paperwork.

g. Working on the computer

h. Reading.

i. Eating/ drinking.

j. Sleeping.

k. Playing games.

When participants were asked, "If given the choice to do any of the following activities which would you prefer to do while waiting in the hospital outpatient waiting room?" they were able to choose from a seven point likert scale which ranged from one representing "strongly dislike" to seven representing "strongly like". All of the activities receive a minimum value of one and a maximum value of seven, although "Reading's" minimum of one was an outlier. "Reading" (M = 6) received the highest median of all

activities. "Sitting and looking at things", "Writing/ doing paperwork", "Working on the computer", "Eating/ drinking", "Sleeping" and "Playing games" all shared the lowest median (M = 4). See Figure 4 Box plot of Users' Preferred Activities for box plot of all ranges, medians, first and third quadrants and outliers of participant responses. The central box for each activity represents the first and third quadrants, with the bottom line of the box being the first quartile, the 25th percentile, and the top line being the third quartile, the 75th percentile. The line centered in most boxes represents the median which is the central distribution, the 50th percentile. If the median can not be seen in the center, then it lies either on the first or third quartile. Medians are also identified in the text, for easy identification. The lines that extend from the boxes represent the responses outside the first and third quartiles. The asterisks represent outliers, responses that fall outside the interquartile range by a multiple of 1.5 (Moore and McCabe, 2003).

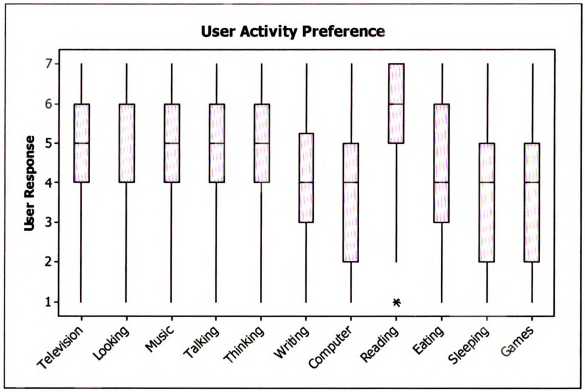

Figure 3. Box Plot of Users' Preferred Activity

Based on participant responses, ranks were given to activities according to the calculated mean of user activity preference. "Reading" (mean = 5.894) received the highest ranking. "Playing games" (mean = 3.473) received the lowest ranking. See Table 6 Mean and SD of Users' Preferred Activities and Ranking by Mean for all activities' ranks, means and standard deviations.

Table 6

Mean and SD of Users' Preferred Activities and Ranking by Mean

Rank	Activity	Mean	SD
1	Reading	5.894	1.223
2	Listening to Music	5.067	1.450
3	Watching Television	4.889	1.704
4	Thinking/ Praying/ Meditating	4.841	1.646
5	Talking	4.632	1.543
6	Sitting and Looking at Things	4.253	1.737
7	Eating/ Drinking	4.134	1.815
8	Writing/ Doing Paperwork	4.087	1.741
9	Sleeping	3.770	1.785
10	Computer	3.581	1.881
11	Games	3.473	1.896

Calculated from 7 point scale (7 = strongly like, 1 = strongly dislike)

In order to further understand the respondents' preferences, a paired t-test was used to distinguish extent of difference between means. "Reading" (p-value = 0.00) achieved the lowest p-values when compared to all other activities. Therefore, this study finds hypothesis 1g to be true, hypotheses 1a, 1b, 1c, 1d, 1e, 1f, 1h, 1i and 1j were rejected. See Table 7 Results from Paired T-Test of Users' Preferred Activities for the p-values comparing all activities. Numbers labeling the table are the rankings of factors found in Table 6.

Table 7

Results from Paired T-Test of Users' Preferred Activities ***

	1	2	3	4	5	6	7	8	9	10	11
1	____	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
2		____	0.23	0.15	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
3			____	0.83	0.16	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
4				____	0.21	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
5					____	0.03*	0.00*	0.01*	0.00*	0.00*	0.00*
6						____	0.54	0.46	0.00*	0.00*	0.00*
7							____	0.92	0.03**	0.00*	0.00*
8								____	0.09	0.00*	0.00*
9									____	0.39	0.12
10										____	0.57
11											____

* P-value $\leq$ 0.01

** P-value $\leq$ 0.05

*** Numbers representing activities by preference ranking: 1 = Reading, 2 = Listening to Music, 3 = Watching television, 4 = Thinking/ Praying/ Meditating, 5 = Talking, 6 = Sitting and Looking at Things, 7 = Eating/ Drinking, 8 = Writing/ Doing Paperwork, 9 = Sleeping, 10 = Computer, 11 = Games

User's were asked, "Are there other activities that you would like to do while waiting in the hospital outpatient waiting room? Please list if any." The written responses to this question can be found in Appendix D.

Hypothesis 2. Preferences of users' activities will be different between patients and companions in the hospital outpatient waiting room.

Responses to the question, "If given the choice to do any of the following activities, which would you prefer to do while waiting in the hospital outpatient waiting room," when separated into two groups according to user type, did not indicate significant difference between patient and companion activity preferences. See Figure 4 Box Plot of Users' Preferred Activities According to User Type for box plots of all ranges, medians, first and third quadrants and outliers for both patients' and patient companions' responses.

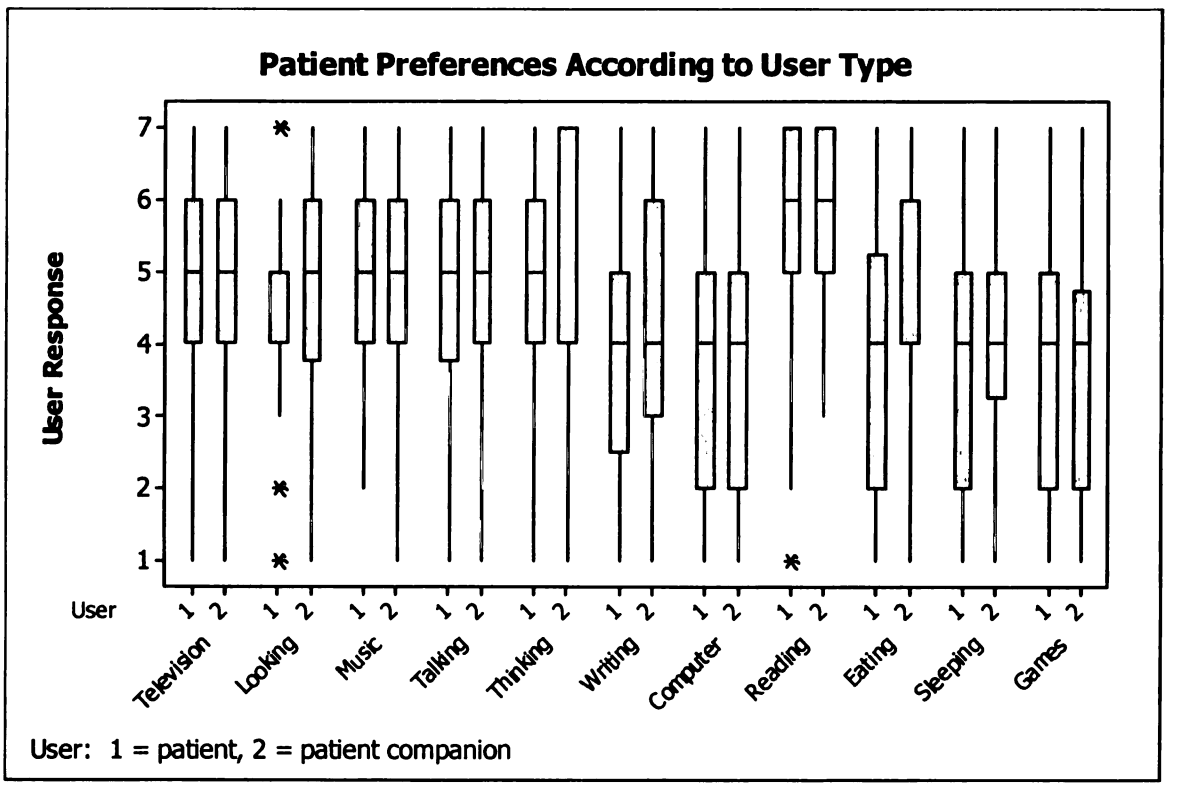

Figure 4. Box plot of Users' Preferred Activities According to User Type

Based on the means, a rank for each activity for both patient and companion was established. The rank order for patients varied from that of the companions. Four of the activities including: "Thinking/ praying/ meditating", "Watching television", "Eating/ drinking", and "Writing/ doing paperwork" were not ranked the same for the patients as they were for companions. The rest of the activity preferences remain in the same order. Using a two sample t-test, p-values were calculated comparing patients and companions' activity preference. All p-values calculated were above 0.05. Therefore, hypothesis 2 was rejected, finding patient and companion preferences to be similar. See Table 8 Preferred Activities: Patients verses Companions for all recorded means, standard deviations and p-values of preferred activities when comparing patients and companions.

Table 8

Preferred Activities: Patient verses Companion

	Patient			Companion			
Activity	Mean	SD	Rank	Mean	SD	Rank	P-value
Reading	5.741	1.311	1	6.091	1.077	1	0.074
Listening to Music	5.186	1.410	2	4.906	1.498	2	0.248
Watching Television	4.942	1.738	3	4.821	1.669	4	0.663
Think/ Pray/ Meditate	4.849	1.523	4	4.831	1.808	3	0.948
Talking	4.558	1.576	5	4.727	1.504	5	0.502
Sitting/ Look at things	4.119	1.624	6	4.435	1.878	6	0.289
Write/ Do Paperwork	3.976	1.704	7	4.231	1.792	8	0.381
Eating/ Drinking	3.930	1.858	8	4.413	1.729	7	0.105
Sleeping	3.667	1.897	9	3.906	1.630	9	0.411
Computer	3.500	1.883	10	3.694	1.887	10	0.539
Games	3.477	1.908	11	3.469	1.894	11	0.980

Hypothesis 3. Users will find the most important environmental factor in hospital outpatient waiting rooms to be:

a. Temperature.

b. Lighting.

c. Noise.

d. Equipment and furniture.

e. Location/ access.

f. View.

g. Privacy.

When asked," In general, how important do you feel the following environmental factors are within the hospital outpatient waiting room," participants were able to choose from a seven point scale, one being very unimportant to seven being very important. "View" (M = 4) was the only environmental factor that did not achieve a median of six. See Figure 5 Box Plot of Importance of Environmental Factors by Users for box plot of all ranges, medians, first and third quadrants and outliers.

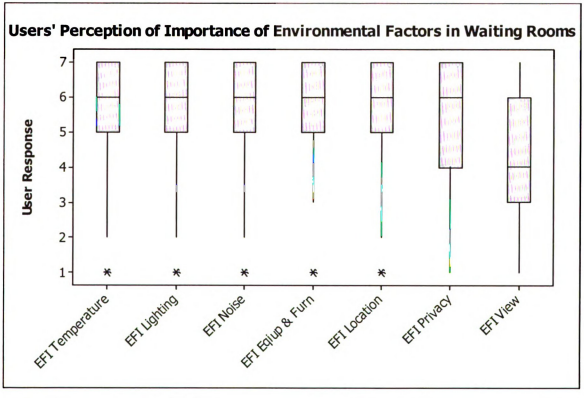

Figure 5. Box Plot of Importance of Environmental Factors by Users

Based on participant responses, ranks were given to environmental factors according to the calculated mean of users' perception of importance. "Temperature"

(mean = 5.649) received the highest ranking. "View" (mean = 4.377) received the lowest ranking. See Table 9 Mean and SD of Importance of Environmental Factors by Users and Ranking by Mean for all of the environmental factors' ranks, means and standard deviations.

Table 9

Mean and SD of Importance of Environmental Factors by Users and Ranking by Mean

Rank	Environmental Factors	Mean	SD
1	Temperature	5.649	1.770
2	Location/ access	5.597	1.743
3	Noise	5.591	1.647
4	Lighting	5.575	1.657
5	Equipment and furniture	5.455	1.669
6	Privacy	5.253	1.667
7	View	4.377	1.879

Calculated from 7 point scale (7 = strongly like, 1 = strongly dislike)

A paired t-test was used to further understand the respondents' perceptions of importance and to distinguish the extent of difference between means. "Privacy" had a p-value less than equal 0.01 when compare to all other environmental factors except "Equipment and furniture". "View" had a p-value less than equal 0.01 when compared to all other environmental factors. Therefore, "Temperature", "Location/ access", "Noise", "Lighting" and "Equipment and furniture" were all found to be equally important with no statistically significant difference between the five factors. The hypotheses 3a through 3g

were rejected, finding none of the environmental factors to be more important than the others. See Table 10 Results from Paired T-Test of Importance of Environmental Factors by Users for the p-values found when comparing all environmental factors' means. Numbers labeling the table are the rankings of factors found on Table 9.

Table 10

Results from Paired T-Test of Importance of Environmental Factors by Users ***

	1	2	3	4	5	6	7
1	____	0.63	0.58	0.11	0.06	0.00*	0.00*
2		____	0.95	0.84	0.12	0.00*	0.00*
3			____	0.83	0.22	0.01*	0.00*
4				____	0.16	0.01*	0.00*
5					____	0.07	0.00*
6						____	0.00*
7							____

* P-value ≤ 0.01

** P-value ≤ 0.05

*** Numbers representing environmental factors by importance ranking: 1 = Temperature, 2 = Location/ Access, 3 = Noise, 4 = Lighting, 5 = Equipment and Furniture, 6 = Privacy, 7 = View

The data of users' perception of importance was also separated into groups: Waiting Room A and Waiting Room B. This was done to look for differences in responses due to the condition and environment of the waiting room. "Privacy" (A: M = 5, B: M = 6) and "View" (A: M = 4, B: M = 4.5) seemed to be the only two factors which

have different medians between the two rooms. See Figure 6 Box Plot of Importance of Environmental Factors by Users According to Room for box plot of ranges, medians, first and third quartile, and outliers.

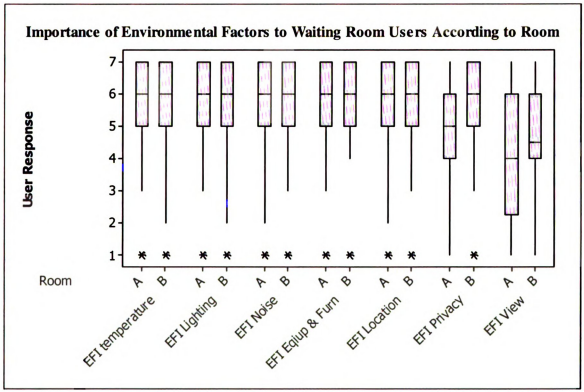

Figure 6. Box Plot of Importance of Environmental Factors by Users According to Room

Although there are differences between the two responses from the two rooms, it is minimal. Means were calculated for each factor for each room. Ranks were then assigned to the factors according to the mean. "Temperature" (A: mean = 5.513, B: mean = 5.782) was ranked number one in both rooms for having the highest mean. "View" (A: mean = 4.184, B: mean = 4.564) received the lowest rank, of seven, for both rooms. Responses for both rooms seemed very similar other than "Noise" and "Lighting" which have switched ranks. P-values were calculated from a two sample t-test using the factors

means for each factor. No statistical difference was found. See Table 11 Importance of Environmental Factors by Users According to Room for a complete list of means, standard deviations, ranks and p-values between the two rooms' means for each factors importance.

Table 11

Users' Perception Environmental Factors Importance According to Room

	Waiting Room A			Waiting Room B			
Environmental Factor	Mean	SD	Rank	Mean	SD	Rank	P-value
Temperature	5.513	1.829	1	5.782	1.711	1	0.348
Location	5.487	1.815	2	5.705	1.676	2	0.440
Noise	5.487	1.724	3	5.692	1.573	4	0.441
Lighting	5.447	1.708	4	5.701	1.606	3	0.345
Equipment/ Furniture	5.382	1.743	5	5.526	1.601	5	0.594
Privacy	5.079	1.655	6	5.423	1.671	6	0.201
View	4.184	1.958	7	4.564	1.792	7	0.211

Hypothesis 4. The environmental factor that users are the most satisfied with in the hospital outpatient waiting room will be:

a. Temperature.

b. Lighting.

c. Noise.

d. Equipment and furniture.

e. Location/ access.

f. View.

g. Privacy.

When participants were asked, "How do feel about the following conditions of the waiting room," user chose a response from a seven point likert scale ranging for one, "Very Dissatisfied," to seven "Very Satisfied," for each of the seven environmental factors. All answers ranged from one to seven, other than "Location/ access" which received a minimum value of two. "Temperature" (M = 6), lighting (M = 6), "Location and Access" (M = 6) all achieved the highest median, equaling six. "View" (M = 4) received the lowest median of all the factors. See Figure 7 Box Plot of Users' Satisfaction with Environmental Factors for a box plot indicating median, first and third quadrants, range and outliers.

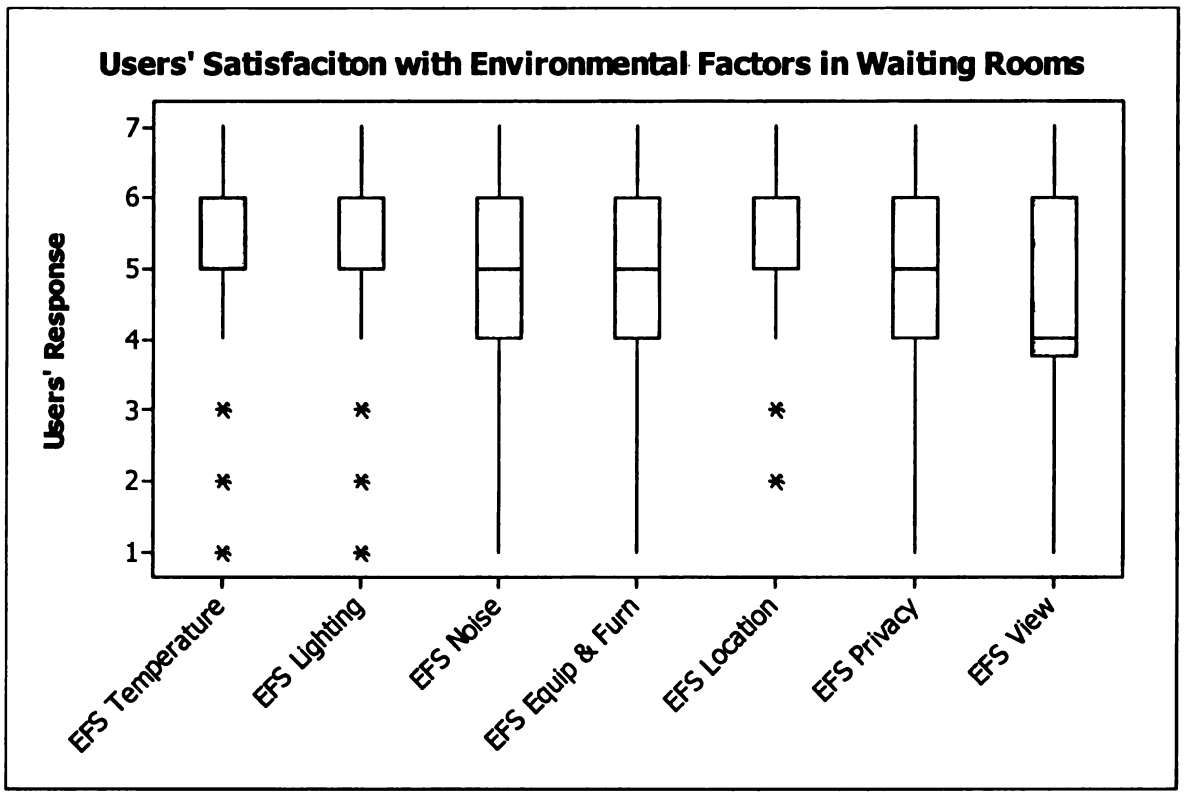

Figure 7. Box Plot of Users' Satisfaction with Environmental Factors

Based on participant responses, ranks were given to environmental factors according to the calculated mean of users' satisfaction. "Location/ access" (mean = 5.675) received the highest ranking. "View" (mean = 4.370) received the lowest ranking. See Table 12 Mean and SD of Users' Satisfaction with Environment Factors and Ranking by Mean for all of the environmental factors' ranks, means and standard deviations calculated.

Table 12

Mean and SD of Users' Satisfaction with Environment Factors and Ranking by Mean

Rank	Environmental Factors	Mean	SD
1	Location/ access	5.675	1.102
2	Temperature	5.591	1.245
3	Lighting	5.556	1.224
4	Equipment and furniture	4.916	1.499
5	Noise	4.708	1.567
6	Privacy	4.630	1.517
7	View	4.370	1.649

Calculated from 7 point scale (7 = strongly like, 1 = strongly dislike)

The paired t-test was used to further understand the respondents' satisfaction with the environmental factors and to distinguish the extent of difference between means. "Location/ access", "Temperature" and "Lighting" are ranked the highest of the environmental factors but when compared none of the p-values are statistically different. Therefore, hypothesis 4a – g were rejected, due to the fact that users did not find one individual environmental factor that they were most satisfied with. See Table 13 Results of Paired T-Test of Users' Satisfaction with Environmental Factors for the p-values when comparing all environmental factors means. Numbers labeling the table are the rankings of factors found on the Table 12.

Table 13

Results from Paired T-Test of Users' Satisfaction with Environment Factors ***

	1	2	3	4	5	6	7
1	____	0.42	0.26	0.00*	0.00*	0.00*	0.00*
2		____	0.51	0.00*	0.00*	0.00*	0.00*
3			____	0.00*	0.00*	0.00*	0.00*
4				____	0.12	0.01*	0.00*
5					____	0.53	0.03**
6						____	0.03**
7							____

* P-value $\leq$ 0.01

** P-value $\leq$ 0.05

*** Numbers representing environmental factors by satisfaction ranking: 1 = Location/ Access, 2 = Temperature, 3 = Lighting, 4 = Equipment and Furniture, 5 = Noise, 6 = Privacy, 7 = View

The data of users' satisfaction responses were also separated into two groups: Waiting Room A and Waiting Room B. This was done to identify differences in responses due to the variations in the waiting rooms' environment. Satisfaction levels remained the same between the two rooms for "Temperature" and "Lighting". All other factors seemed to vary between the rooms. See Figure 8 Box Plot of Users' Satisfaction with Environmental Factors According to Room for box plot of all ranges, medians, first and third quartile, and outliers.

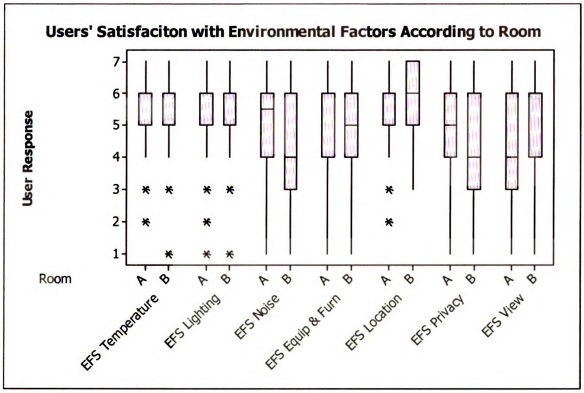

Figure 8. Box Plot of Users' Satisfaction with Environmental Factors According to Room

There is much variation between the responses from the two rooms' satisfaction rating. Means were calculated for each factor for each room. Ranks were then assigned to the factors according to the mean. "Temperature" was ranked number one in satisfaction for room A (mean = 5.671), but was ranked third for room B (mean = 5.513). Whereas, view received the lowest ranking for satisfaction in room A (mean = 4.132), but was ranked fifth for room B (mean = 4.603). Both "Privacy" and "Noise" show a statistical difference between the users' satisfaction in the two rooms. See Table 14 Users' Satisfaction with Environmental Factors According to Room for a complete list of means, standard deviations, ranks and p-values between the two rooms' responses to satisfaction with factors.

Table 14

Users' Satisfaction with Environmental Factors According to Room

	Waiting Room A			Waiting Room B			
Environmental Factor	Mean	SD	Rank	Mean	SD	Rank	P-value
Temperature	5.671	1.100	1	5.513	1.375	3	0.431
Location/ access	5.592	1.110	2	5.756	1.095	1	0.357
Lighting	5.539	1.171	3	5.571	1.282	2	0.872
Noise	5.039	1.446	4	4.385	1.622	6	0.009*
Equipment & furniture	5.026	1.496	5	4.808	1.504	4	0.367
Privacy	4.882	1.376	6	4.385	1.614	7	0.041**
View	4.132	1.731	7	4.603	1.540	5	0.077

* P-value < 0.01

** P-value < 0.05

As a final question on the questionnaire, users were asked, "Any additional comments." The written responses to this question can be found in Appendix D.

Chapter V: Discussion and Conclusion

This chapter covers the discussion, conclusion and implications of this study, as well as, recommendations for future research.

Discussion

Users' Preferred Activities

In asking waiting room users which activities they would prefer to do while waiting in the hospital outpatient waiting room, sample responses gave insight into which activities are most important to focus on when designing a waiting room. The study contained eleven activities listed on the questionnaire. Among these activities, "Reading" (mean = 5.894) was rated as the most preferred activity of the sample according to mean. After "Reading", "Listening to music" (mean = 5.067) was rated second most preferred activity. When comparing "Reading", the most preferred activity, to "Listening to music", the second most preferred activity, there was a statistically significant difference in preference toward "Reading" among users when compared to "Listening to music" and all other activities surveyed.

There could be a few different reasons why "Reading" was found to be the most preferred activity. First of all, Sparrow Health System is located in Lansing, which is in close proximity to East Lansing, home of Michigan State University. Users may be more likely to have a college education. Educated users may be more likely to prefer reading. This could be explained by conjunction with the Opportunity Structure Model, which assumes that an environment is used to accomplish goals, but more than just the goals influence the user, for example, social-cultural background (Gifford, 1997). This is an area which was not a focus of the study but could be an area for future research. Second,

materials to read were provided in the waiting room, therefore reading is a very accessible activity. Three, unlike a television which was also provided in the waiting room, reading allows more choices that could be made privately, without disrupting others. For example, if a user did not like what was on the television he/she could change the channel, but that may disturb others who enjoyed watching the previous channel. With reading a user could easily chose to read a different article or different reading material without disturbing others. Four, users may enjoy reading because it provides privacy. Users can read without anyone else knowing what they are reading. In addition, users may withdraw behind reading materials such as a book or newspaper to create privacy. Lastly, according to the Behavior-Setting theory there are patterns of behavior that correspond to a setting (Gifford, 1997), reading may be the most preferred simply because that is what users have most commonly done in the past and therefore is the behavior pattern they associate with the waiting rooms. Reading has been an activity available to users in waiting rooms much longer than television, computers or vending machines. It may be that many users have just gotten into the habit of reading as the waiting room activity and that is why they prefer it now. Therefore, the results support the Behavior-Setting theory, but only if users of the waiting room are actually doing what they would like to do. Hence, further research could be conducted in this topic.

As previously seen in the literature review, the study by Tivosak et al (2004) had found it is not lack of activity that seems to be the problem, but the lack of interesting activities. Reading was the most preferred activity but this study did not explore which types of reading materials that users would prefer. Further research, could explore reading material preferences and reading common topics of interest.

It may not be surprising that "Listening to Music," was found as the second most preferred activity. The addition of music to a waiting room could make a big improvement to the overall atmosphere of the waiting room. As seen in the study by Tanik and Routhieaux (1999), music can aid in relaxation and reduce stress. Future studies may be useful in finding out which types of music has the biggest impact on users. Music types suggested by users include: classic, instrumental, jazz and modern. See appendix D, Users' Written Responses on the Questionnaire, for all comments.

After "Listening to music", "Watching television" (mean 4.889) was rated third most preferred activity. Unexpectedly, although watching television was rated highly as an activity preferred among users, there were quite a few negative comments about the television in the waiting room. Remarks such as, "TV is a loud, & there should be separate area for other who can't be without it," and "Too much TV," were not uncommon. One respondent commented, "I like to watch TV while in waiting room but feel uncomfortable turning channel or turning up volume because I would have to reach over people and also don't want to make others uncomfortable." See appendix D, Users' Written Responses on the Questionnaire, for all comments. It appears that although television received positive remarks overall, it also received quite a few negative responses. Hence, television while making many happy, may offend others. Therefore, when designing waiting rooms with a television, accommodations could be made for those who do not enjoy it.

After television, the next activity according to the preference of the waiting room users was "Thinking/ praying/ meditating" (mean = 4.841). "Listening to music", "Watching television", "Thinking/ praying/ meditating" were not found to be statistically

different. Therefore, according to means these three activities all have definite standings, however when evaluating these differences statistically, they all received ratings which fell very closely together.

"Talking" (mean = 4.632) was the fifth most preferred activity among waiting room users. "Talking" was not found to have a statistically significant difference between "Watching television" and "Thinking/ praying/ meditating". However, a statistically significant difference was found between "Talking" and "Listening to music," the number two rated activity, as well as "Sitting and looking at things," (mean = 4.253) the sixth rated activity, "Eating/ drinking" (mean = 4.134) ranked seventh and "Writing/ doing paperwork," (mean = 4.087) the eighth ranked activity.

"Sleeping" (mean = 3.770) was the rated the ninth preferred activity according to mean, followed by "Working on the computer" (mean = 3.581) at tenth and "Playing games" (mean = 3.473) as the least rated activity. There was not a statistically significant difference between "Writing/ doing paperwork" and "Sleeping" nor was there one between "Sleeping", "Working on the computer" and "Playing games". However, there was a statistically difference between "Writing/ doing paperwork" when compared to "Sleeping" or "Playing games".

Comparing means "Reading", "Listening to music", "Watching television", "Thinking/ praying/ meditating" and "Talking" were found to be viewed positively by the sample. Therefore, the waiting room should provide the necessary elements in order for users to easily participate in these activities.

"Looking at things", "Eating/ drinking", "Writing/ doing paperwork" according to the mean, received indifferent ratings. Although these activities were not found to be as

important to the waiting room environment as the prior activities listed, they were still liked by many of the respondents and should be addressed within the waiting room environment.

According to their calculated means "Sleeping", "Working on the computer" and "Playing games" received primarily negative responses. These activities were not preferred and do not need to be addressed within the waiting room environment. However, if a waiting room user had a strong preference towards any of these activities they could provide themselves with the necessary items. For example, if a user knew that they prefer to work on the computer while waiting, they could bring a laptop with them. In this case, internet could be provided in the room. If the issues for providing a suitable environment for the most preferred activities such as "Reading" and "Watching television" are addressed, the environment should also suit a laptop user.

Users' Preferred Activity According to User Type

The responses from the preferred activity questions were analyzed, using a two sample t-test to identify difference in activity preferences between patients and companions. Surprisingly, as mentioned in the results, there was no statistical difference found. Therefore, patients and their companions seem to enjoy the same types of activities while in the outpatient waiting room.

Although "Reading" was not found to have a significant statistical difference between patients and companions, the p-value found when comparing patients and companions preferences towards "Reading" was .074, making the relationship nearly significant. Companions preferred "Reading" (mean = 6.091) more than patients (mean = 5.741). Companions may possibly prefer "Reading" more because they generally end up

spending more time in the waiting room. Hence, they have more time to get into an article before having to leave.

Other differences existed between patients and companions. For patients, "Watching television" (mean = 4.942) was more important than "Thinking/ praying/ meditating" (mean 4.849). Whereas, companions responded the opposite (Watching television: mean = 4.821; Thinking/ praying/ meditating: mean = 4.831). This may be because patients are trying to distract themselves from worries, while companions have a different perspective of the situation which is less self involved. This can be related back to the study by Tansik and Routhieaux (1999). In this study, it was found that companions are often relied on for their opinions and information, because they tend to be of a sounder mental state during the time.

Importance of Environmental Factors by Users

When asking waiting room users how important they felt each of the environmental factors were within the hospital outpatient waiting room, the samples' responses indicated which factors they felt were the most important. According to the mean values achieved from the participants' responses, "Temperature" (mean = 5.649) was the most important environmental factor to waiting room users followed by: 2) "Location/ access" (mean = 5.597), 3) "Noise" (mean = 5.591), 4) "Lighting" (mean = 5.575), 5) "Equipment and furniture" (mean = 5.445). From these five environmental factors, through use of a paired t-test, there were no statistically significant differences found. Overall users did not find any of these factors to be overwhelmingly more important than another. The users' may have found approximately all five environmental

factors to be of the highest importance because in order to have a successful environment, which is comfortable to the user, each one of the five must be accommodating to the user.

The sixth rated factor according to mean was "Privacy" (mean = 5.253). There was a statistically significant difference between privacy and all the previously listed factors except for "Equipment and furniture". Hence, users felt that "Privacy", "Equipment and furniture" are fairly similar in importance. "View" was found to be the least important of the environmental factors. The statistical significant difference indicated that "View" is by far the least important factor. Users may have rated this as least important because they felt that a "View" is not essential to being comfortable within the environment.

This study surveyed two different waiting rooms in attempts to identify any difference in opinions that may have occurred due to slightly different environments. The only difference found was that users of Waiting Room A found "Noise" (ranked 3rd) to be more important than "Lighting" (ranked 4th), whereas those in Waiting Room B found the opposite. However, a two sample t-test found that a statistically significant difference was not found. Therefore, users of both rooms generally agreed on the importance of the environmental factors within the waiting rooms.

Users' Satisfaction with Environmental Factors

Participants were asked how they felt about the conditions of the waiting room that they were currently in, to find out if it affected their perception of importance of the environmental factors and in order to begin establishing what users felt were acceptable conditions. "Location/ access" (mean = 5.675) was the factor that users' proved to be the most satisfied with, followed by "Temperature" (mean = 5.591) and "Lighting" (mean =

5.556). According to the calculations from a paired t-test, there were no statically significant differences between these three factors. Hence, users are nearly equally satisfied with all three factors. On the other hand, "Equipment and furniture" (mean = 4.916), ranked fourth in satisfaction, was found to be statistically significant when compare to the other three factors that were higher ranked. The fifth rank factor was "Noise" (mean = 4.708), followed by privacy (mean = 4.630) in sixth. Lastly, "View" was found to be the factor that the users found the least satisfaction with. When comparing "View" to all other factors a statistically significant difference was found, making it clearly the factor that users were most dissatisfied with. Overall, "Location/ access" did receive the highest mean, but it was not statistically different enough from "Temperature" and "Lighting" to be considered the most satisfactory. Overall, Waiting Room B, the newer of the two rooms, had lower levels of satisfaction when compared to Waiting Room A.

Even though this was not a focus of the study, when comparing the users satisfaction between Waiting Room A and B there were statistical differences. Both "Noise" and "Privacy" were found to have statistical significant difference when the factors were compared between the two rooms. Therefore, users were significantly less satisfied with the conditions of "Noise" and "Privacy" in Waiting Room B. Originally this question was designed to identify whether participants answers to importance of factors were influenced by the conditions of the waiting room they were currently in. When responding to satisfaction with the current waiting room users of Waiting Room B indicated lower levels of satisfaction with the room's "Temperature", "Noise", "Equipment and furniture", and "Privacy" than users of Waiting Room A. When

compared to their responses to the importance of these factors users of Waiting Room B found these same factors to be more important than users of Waiting Room A. Therefore, similar to the findings from Farrenkopf and Roth (1980), this study finds that perceived deficiencies in conditions of the waiting room leads to a greater feeling of importance towards that condition. Furthermore, users may have found Waiting Room B to be less satisfied with "Temperature", "Noise" and "Privacy" due to the fact that there were no doors separating the waiting room from the main lobby and entrance to the hospital, which was a high traffic area and contained access to the outdoors. Therefore, users responses to satisfaction with environmental factors supports the Stimulation Theory which stated that the physical environment is a supplier of sensory information which can affect overall well being. For example, over stimulation of noise has lead to a negative effect on the participant satisfaction, which also possibly leads to a change in their perception of the factor's overall importance (Gifford, 1997).

Summary

The following is a summary of the results of this study:

Users' Preferred Activities

1. "Reading" was the most preferred activity among users of the hospital outpatient waiting room.
2. "Listening to music", "Watching television", "Thinking, praying and meditating" were all found to be closely related among users' responses, second to "Reading".
3. "Working on the computer" and "Playing games" were found to be the least preferred activities among hospital outpatient waiting room users.

Users' Preferred Activity According to User Type

Patients and companions of the hospital outpatient waiting room, for the most part, both seem to prefer the same activities.

Importance of Environmental Factors by Users

1. According to mean, "Temperature" was the environmental factor thought to be the most important among the sample.
2. When looking at statistical differences, "Temperature", "Location/ access", "Noise", "Lighting", "Equipment and furniture" all seem to be rated equally important to users.
3. "View" was the environmental factor that was the least important among the sample.

Users' Satisfaction with Environmental Factors

1. "Location/ access" achieved the highest mean making it the environmental factor that the sample was most satisfied with in the hospital outpatient waiting rooms.
2. When factoring in statistical difference, "Location/ access", "Temperature" and "Lighting" were all environmental factors that the sample was most satisfied with in the hospital outpatient waiting rooms.
3. Overall, the "View" was the environmental factor that the sample found least satisfactory.
4. When looking at Waiting Room A and B separately, there are many differences in the sample's satisfaction with the environmental factors.

"Noise" and "Privacy" are the two environmental factors with the greatest difference in satisfaction between the two rooms.

Implications

Since reading was found to be the most preferred activity the following could be considered when creating the waiting room environment.

1. Lighting could be addressed within the environment. Appropriate illuminance levels should be achieved in order for users to read easily. Glare should be avoided by proper placement of light source. Furthermore, general lighting should be supplied to help balance brightness of field of view (Dechiara, J. et al, 2001).
2. Reading material could be supplied for users that did not bring their own. All write-in responses on questionnaires pertaining to reading were complaints or suggestions indicating more up-to-date reading material should be supplied in a variety of topics. Purchasing of reading materials that suit a wide range of interest that do not easily go out of date may be a solution.
3. Although it was not included in the study, during the time of data collection, the researcher observed that reading materials for user with disabilities were not supplied. Reading materials with large print or in Braille, for users that have poor eye sight or who are blind, could be supplied.
4. When supplying reading material an accessible place for storage should be supplied. For example, magazines could be kept in a magazine rack or a

table that is easy to find and reach. From researchers observations, magazines piled on a table in the back corner of the room next to people seated around it can be hard to access without disturbing others. Placing magazines near traffic paths from the reception area to the waiting room may be more convenient.

5. Since, the sample generally found reading to be a preference, but did not seem to like working on the computer or playing games nearly as much, it may be best to invest in interior elements which are conducive to reading rather than in a television entertainment, systems computer station, vending machines, etc.

Although reading was the most preferred, other activities also placed very highly among users' preferences. The environment best suited for watching television may not be the best solution for reading and listening to music as well. Zoning an area with soft music may be suitable for readers and users wanting to think, pray or meditate, with a separate area for television watchers and talkers may be a reasonable solution. Other solutions may be found for spaces where separate zoning is not an option, such as setting the television on closed captioning.

Due to the results of the responses to the questionnaire the following recommendations were made according to importance of environmental factors:

1. Location and access was one of the factors rated most important to users. On the other hand, view was found to be the least important. Therefore, space planning should be geared towards placing waiting rooms in areas

that are easy to find and access, rather than manipulating the space in order to allow the users to have a pleasant view.

2. Temperature is not simply maintained with a good HVAC system. In order to make the room's temperature controllable access to sunlight and exterior entrances must also be controlled. This, then, may combine with factors such as location and access as well as view. However, view was not thought of as being very important, so when choosing between natural sun light and temperature control, shades might be preferred.
3. Noise, appearing to be of importance to the user, could be addressed in a number of ways. Through researchers observations during data collection high levels of decibels were often due to a number of factors. First of all, the television was a constant source of noise. Many of the written comments from participants when pertaining to the television were complaints of excessive noise, asking for separate area for the television, headphones, or even for the subtitles instead of sound. Children also seemed to be a large source of negative noise. Many of the highest levels of decibels recorded were due to children who had seemed to have gotten bored by waiting. Supplying methods of entertaining children may be a solution to this problem. However, noise can also be viewed as a positive factor. One participant commented that they did not like hearing other conversations. Noise could help provide privacy, masking talkers conversations. Furthermore, most comments written in about music were very positive, some asking for classical, instrumental, light or soft music.

4. Lighting is not only important for reading; users' also found it to be an important environmental factor. Due to the variety of activities that may be taking place, an array of illumination levels could be suggested. An illuminance level of twenty footcandles is suggested as a minimum for this environment (Dechiara, J., et al, 2001).
5. Furniture was also viewed to be important to users. Some users wrote in comments suggesting elements such as lumbar support, reclining chairs and foot stools to add comfort to furniture. One participant commented that more chairs with arms were needed to make it easier to get in and out of chairs. The researcher observed two different occasions when patients could not fit into the chairs, and therefore could not sit while waiting. One chair does not fit all. A variety of different types and sizes of seating may be useful in creating an enjoyable environment. However, furniture was grouped with equipment, but did not seem to be as important. Using a computer, eating and drinking were not highly preferred among users, therefore, items such as computers and vending machines do not seem very important to supply. The television could perhaps be the only equipment that is of importance to the user.

The primary focus of this study was to identify users' opinions to create a reference for professionals. Who design and manage waiting room environments that reduce stress and increase user satisfaction. The following are professions that may apply these results to achieve this goal: interior designers, facilities managers, healthcare providers, interior design educators and students.

This study could be utilized during the programming stage of design. It calls attention to design considerations that should be recognized within the hospital outpatient waiting environment. When designing a space it is important to consider function as well as the form. Designers understand that the purpose of a waiting room may be to wait, but it is not the only activity that will be taking place. By understanding what users like and feel is important, designers can focus on those aspects rather than spending time and money on design elements that users are indifferent about.

This study could be used as a guide for making and justifying decisions when managing the hospital outpatient waiting room. Facilities managers could also use this study as a resource when deciding whether minor changes could be made to improve the quality of users' experiences while in the waiting room or if extensive work needs to be done.

This study could financially benefit healthcare providers if applied. As seen in the study by Pruyn and Smidts (1998) the quality of environment is be more important than length of time spent waiting. Through application of this study, waiting room users will become more satisfied with their experience, therefore, improving the customers opinion of the healthcare system overall.

This study could be utilized as a learning tool in design education. This study demonstrates the important relationship between the user and the function and form of the designed space. This study could be used as an example of how a space has many design considerations that should be addressed.

Future Research

Based on the limitations, assumptions and the results of this study the following future research is recommended:

1. Due to the fact that reading was preferred the most by users and the fact that the Lansing area is located adjacent to a large university, research could be done in areas where patients have study areas with different demographic backgrounds to evaluate educational background as a study variable.
2. Although the quantitative study was an effective way to get input from a large number of participants, a qualitative study could prove to be useful in better understanding user's opinions. Focus groups lead in discussions or interviews could prove to generate further information.
3. In order to utilize purchasing of reading materials for waiting rooms, further research could be developed to explore what types of reading materials users would prefer. For example, would waiting room users prefer reading magazines, newspapers, medical journals or books?
4. Further research in trends in users' age and their preference toward technological methods versus conventional methods of entertainment while waiting is recommended. For example, did younger users tend to favor watching television and using a computer than older users?
5. Although, it was not a focus of the study a difference in activity preference could be seen between males and females. Further research could be utilized to explore gender preferences in waiting rooms.

Appendices

Appendix A

UCHRIS Approval Letter

MICHIGAN STATE
UNIVERSITY

April 5, 2004

TO: Nam-Kyu PARK
315 Human Ecology

RE: **IRB# 04-180S** CATEGORY: EXEMPT 1-2

APPROVAL DATE: April 3, 2004
EXPIRATION DATE March 3, 2005

TITLE: The hospital outpatient waiting room as an environment

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete and I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the **UCRIHS approved this project.**

This protocol falls under the Reliance agreement between MSU and Sparrow Hospital effective June 16, 2003. Therefore, UCRIHS is now the IRB of record. However, investigators must submit a reliance application to the IRRC at Sparrow Hospital. Visit: www.sparrow.org/irrc/Research.asp and click on IRB Reliance Application.

RENEWALS: UCRIHS approval is valid until the expiration date listed above. Projects continuing beyond this date must be renewed with the renewal form. A maximum of four such expedited renewals are possible. Investigators wishing to continue a project beyond that time need to submit a 5-year application for a complete review.
REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please include a revision form with the renewal. To revise an approved protocol at any other time during the year, send your written request with an attached revision cover sheet to the UCRIHS Chair, requesting revised approval and referencing the project's IRB# and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.
PROBLEMS/CHANGES: Should either of the following arise during the course of the work, notify UCRIHS promptly: 1) problems (unexpected side effects, complaints, etc.) involving human subjects or 2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of further assistance, please contact us at (517) 355-2180 or via email: UCRIHS@msu.edu. Please note that all UCRIHS forms are located on the web: http://www.humanresearch.msu.edu

Sincerely,

Peter Vasilenko, Ph.D.
UCRIHS Chair

OFFICE OF
RESEARCH ETHICS AND STANDARDS
University Committee on Research Involving Human Subjects
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Appendix B

Consent Form

The hospital out patient waiting room as an environment

The purpose of this research is an exploratory study to investigate the preferred activities, preferred environmental factor and satisfaction of patients and companions while in the hospital outpatient waiting room. Your input is very important to this study. It will help the researchers to gain more insight into the design of waiting rooms to create an enjoyable environment. The questionnaire is a combination of multiple choice, fill in the blank and 7-point scales. There are 23 questions in the questionnaire.

The questionnaire will take approximately 15 –20 minutes to complete. We would appreciate it if you would take the time to answer each statement as honestly as you can. There is no potential risk involved in the study. Your privacy will be protected to the maximum extent allowable by law. Your answers will be kept confidential. Individual names will not be revealed in the report. We only need your honest opinion.

You freely consent to participate, and participation is voluntary. You may choose not to participate at all, may refuse to participate in certain procedures or answer certain questions, or may discontinue the questionnaire at any time without penalty

Please complete this questionnaire before leaving the waiting room. Place the completed questionnaire into the box labeled, "Waiting Room Survey." Place this consent form in the box labeled, "Consent Form." The two boxes are located in this waiting room near to the reception window. I will remain in the room to answer any question you may have about the questionnaire.

If you have any questions regarding the questionnaire or wish to make comments and suggestions to us, please contact researchers:

Jamie McLelland	Phone: (517) 353-7812	Email: mclell12@msu.edu
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If you have any questions about being a subject of this research, please contact:

Peter Vasilenko	Phone: (517) 355-2180	Chair, UCRIHS

Your signature indicates your voluntary agreement to participate in this study.

Your Signature _____ Date_____

Thank you!

UCRIHS APPROVAL FOR
THIS project EXPIRES:

MAR 3 2005

SUBMIT RENEWAL APPLICATION
ONE MONTH PRIOR TO
ABOVE DATE TO CONTINUE

Appendix C

Questionnaire

OUTPATIENT WAITING ROOM QUESTIONNAIRE

For researchers use only.

Please circle the appropriate answer.

1) Gender:
- a) Male
- b) Female

2) Age:
- a) 18-29
- b) 30-39
- c) 40-49
- d) 50-59
- e) 60-69
- f) 70-100

3) Race:
- a) Caucasian Non-Hispanic
- b) Hispanic
- c) African American Non-Hispanic
- d) Mexican American
- e) American Indian
- f) Asian American
- g) Other_____

4) Are you using a waiting room as a:
- a) Patient
- b) Patient companion

If Patient (answer 5a & 6a)

5a) Did you bring anyone with you to the waiting room?
- a) Yes
- b) No

6a) If yes, how many people?
- a) 1
- b) 2
- c) 3
- d) more than 3

If *NOT* Patient (answer 5b & 6b)

5b) What is your relationship to the patient:
- a) family member
- b) friend
- c) other _____

6b) Will you be waiting in the waiting room during your companion's medical appointment?
- a) Yes
- b) No

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7) How often do you use this waiting room?
- a. daily
- b. weekly
- c. monthly
- d. yearly
- e. this is the only time I have been here
- f. other_____

8) How long have you been waiting in this waiting room? ____hours ____minutes

9) How long do you expect to be waiting in this waiting room? ____hours ____minutes

10) If you are stressed, how much stress would you say you are under?

Very Stressed 1 2 3 4 5 6 7 Hardly any stress

11) If given the choice to do any of the following activities which would you prefer to do while waiting in the hospital out patient waiting room? Please rate each activity according to your preferences. These are <u>not necessarily activities</u> that you are able to do in the current waiting room you are in. Please (circle) the most appropriate number for each activity:

	Strongly dislike	Do not like	Somewhat do not like	Neutral	Somewhat like	Like	Strongly like
Watching television	1	2	3	4	5	6	7
Sitting & looking at things	1	2	3	4	5	6	7
Listening to music	1	2	3	4	5	6	7
Talking	1	2	3	4	5	6	7
Thinking/ praying/ meditating	1	2	3	4	5	6	7
Writing/ doing paper work	1	2	3	4	5	6	7
Working on the computer	1	2	3	4	5	6	7
Reading	1	2	3	4	5	6	7
Eating/ drinking	1	2	3	4	5	6	7
Sleeping	1	2	3	4	5	6	7
Playing games	1	2	3	4	5	6	7

12) Is there other activities that you would like to do while waiting in the hospital outpatient waiting room? Please list if any. _____

_____

13) Do you think the waiting room you are <u>currently in</u> supports the <u>activities</u> that you would like to do?

Not at all 1 2 3 4 5 6 7 Yes extremely

Questions 14 – 22: Ask for your opinions about environmental factors. The following is a brief definition of environmental factors used in this study.

Temperature: Air temperature that you feel in the room.
Lighting: Appearance and characteristics of the light in the room.
Noise: Any sound that can be heard in the room.
Equipment and Furniture: Items in the room, such as a televisions, computers, vending machines, chairs and tables.
Location/ Access: Proximity of room in relation to bathroom, patient rooms, or nursing station.
Privacy: Visual, auditory and physical access to others in the room, also related to personal space, and crowding.
View: Something to see or observe from the room.

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14) <u>In general</u>, how important do you feel the following environmental factors are within the hospital outpatient waiting room? Please (circle) the most appropriate number for each factor:

	Very unimportant	Unimportant	Somewhat unimportant	Neutral	Somewhat important	Important	Very important
Temperature	1	2	3	4	5	6	7
Lighting	1	2	3	4	5	6	7
Noise	1	2	3	4	5	6	7
Equipment & furniture	1	2	3	4	5	6	7
Location/ access	1	2	3	4	5	6	7
Privacy	1	2	3	4	5	6	7
View	1	2	3	4	5	6	7

Questions 15-23: In reference to the waiting room you are currently in; please circle the most appropriate number for each factor:

15) How do you feel about the following conditions of the waiting room?

	Very dissatisfied	Dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Satisfied	Very satisfied
Temperature	1	2	3	4	5	6	7
Lighting	1	2	3	4	5	6	7
Noise	1	2	3	4	5	6	7
Equipment & furniture	1	2	3	4	5	6	7
Location/ access	1	2	3	4	5	6	7
Privacy	1	2	3	4	5	6	7
View	1	2	3	4	5	6	7

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16) Temperature:

Too Cold	1 2 3 4 5 6 7	Too Hot
Inadequate	1 2 3 4 5 6 7	Adequate
Unpleasant	1 2 3 4 5 6 7	Pleasant

17) Lighting:

Too Bright	1 2 3 4 5 6 7	Too Dim
Inadequate	1 2 3 4 5 6 7	Adequate
Unpleasant	1 2 3 4 5 6 7	Pleasant
Intense	1 2 3 4 5 6 7	Relaxing

18) Noise:

Too Loud	1 2 3 4 5 6 7	Too Quiet
Unpleasant	1 2 3 4 5 6 7	Pleasant
Inadequate	1 2 3 4 5 6 7	Adequate

19) Equipment and Furniture:

Inefficient	1 2 3 4 5 6 7	Efficient
Unorganized	1 2 3 4 5 6 7	Organized
Inadequate	1 2 3 4 5 6 7	Adequate
Uncomfortable	1 2 3 4 5 6 7	Comfortable

Chairs:

Inappropriate	1 2 3 4 5 6 7	Appropriate

Television:

Inappropriate	1 2 3 4 5 6 7	Appropriate

20) Location/ Access: Waiting Room in relation to...

Bathroom:

Too Close	1 2 3 4 5 6 7	Too Far

Reception:

Too Close	1 2 3 4 5 6 7	Too Far

Patient Room:

Too Close	1 2 3 4 5 6 7	Too Far

21) Privacy:

Crowded	1 2 3 4 5 6 7	Not Crowded
Annoying	1 2 3 4 5 6 7	Pleasant

Auditory distraction:

Inadequate	1 2 3 4 5 6 7	Adequate

Visual distraction:

Inadequate	1 2 3 4 5 6 7	Adequate

Personal Space:

Inadequate	1 2 3 4 5 6 7	Adequate

22) View:

Inadequate	1 2 3 4 5 6 7	Adequate
Unpleasant	1 2 3 4 5 6 7	Pleasant
Unattractive	1 2 3 4 5 6 7	Attractive

23) Overall to what extent is this waiting room meeting your expectations during this visit?

Not meeting	1 2 3 4 5 6 7	Exceeding

Any additional comments?

Thank You!!!

Appendix D

Users' Written Responses on the Questionnaire

Users' Written Responses on the Questionnaire

The following are user's responses to question number 12 of the questionnaire, "Is there other activities that you would like to do while waiting in the hospital outpatient waiting room? Please list if any."

Waiting Room A

- "Video games, x-box, Play station."
- "Classical music."
- "Exercise."
- "Internet."
- "Cross Stitch."
- "Knitting/ Needlework."
- "Jazz Music Preferred (Classical or Modern)."
- "If I'm waiting at the right time, I'd like to watch the only soap opera I like."
- "Not be annoyed by loud talk or other peoples problems."
- "Puzzles."
- "It would be nice to have foot stools for those of us with leg and back problems."
- "NY Times / Crossword / puzzle."
- "Depends on type of music! Instrumental would be fine (soft)."
- "Maybe a wider selection of reading materials. Maybe some cards, tablespace."
- "I have never seen a card table in most waiting rooms. That would be nice for puzzles, cards, etc."

- "Nicer than most waiting rooms."

Waiting Room B

- "Reading decent magazines."
- "Reading new medical literature – a bulletin board would be nice."
- "Read on tapes for the blind."
- "Smoke, reclining chairs."
- "Being able to talk with family member if one comes along."
- "Light soft music, USA today."
- "Internet."
- "Word Puzzles."
- "Walking, exercise – for stress relief."
- "Walking around."

The following are user's responses to question number 24, the last question of the questionnaire, "Any additional comments?"

Waiting Room A

- "TV is a loud, & there should be separate area for other who can't be without it."
- "If we must have TV, Use no sound and Subtitles."
- "Not enough seating"
- "Personnel are always cheerful and helpful."
- "Room too small, TV is not big."

- "I like to watch TV while in waiting room but feel uncomfortable turning channel or turning up volume because I would have to reach over people and also don't want to make others uncomfortable. "
- "Up to date things to read."
- "Chairs uncomfortable."
- "Perhaps a divider for TV/ non-TV room or earphones for those wishing to hear the TV.
- It would be nice to have furniture that accommodates orthopedic issues – maybe a few chairs that recline and lumbar rolls for back issues."
- "Put some colors on the walls. Need floor lamps."
- "Vending machines would be nice...separate rooms for patients waiting to be x rayed and people waiting while long procedures are being done."
- "I don't know where the bathroom is."
- "Too much TV. Better reading material would help."

Waiting Room B

- "Waiting room was adequate not exceptional."
- "Everything is to far when your handicapped."
- "An area for kids to play is always helpful."
- "Need more chairs with arms – hard to get up and down without arms on chairs."
- "I find televisions distracting and irritating in waiting rooms, but everything else is very pleasant."
- "Very convenient and pleasant."

- "Personnel in hospital or Dr. offices, etc. should never wear perfume."
- "Amount of time you have to wait."
- "Lab needs its own waiting room."
- "For the money hospitals have, the furniture is uncomfortable."
- "They are efficient in this area of the health system. I'm not here for anything serious (yearly) therefore the waiting room isn't much of a concern for me."
- "Furniture and Carpet update."
- "Waiting rooms are not designed with stressor considerations that patients experience while waiting. Stress reducing distractions would benefit the patient and should be the primary focus after all the patient and their comfort should come first. Research has proven low stress environments have beneficial impact on persons in waiting rooms, or anxious."

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