

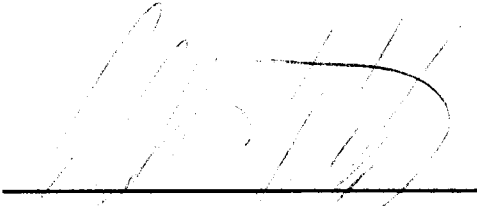
To the Graduate Council:

I am submitting herewith a thesis written by Valérie Andriani entitled "Restaurant Environments: The Influence of Environmental Attributes on Preference." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Interior Design.



Millend K. Gupta, Major Professor

We have read this thesis and recommend its acceptance:





Accepted for the Council:



Associate Vice Chancellor and
Dean of the Graduate School

RESTAURANT ENVIRONMENTS:
THE INFLUENCE OF ENVIRONMENTAL ATTRIBUTES ON PREFERENCE

A Thesis Presented for the Master of Science Degree
The University of Tennessee, Knoxville

by
Valérie Andriani
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ABSTRACT

Research indicates that although commonly preferred environmental attributes exist, designers and laypersons do not share a preference for the same ones. In addition, research in the built environment has overlooked restaurant environments despite their increasing success and importance. If designers are to create spaces that the end-users will satisfactorily use and enjoy, they must be aware of not only their needs and wants but also of their preferences.

This study investigated the ability of ten environmental attributes (sensory stimulation, coherence, comfort, complexity, formality, mystery, nature, novelty, privacy and spaciousness) to predict preference in upscale restaurants as exhibited by three groups of subjects: the restaurant patrons, the restaurant professionals and the interior designers represented respectively by students from the departments of Child and Family Studies, Hotel and Restaurant Administration, and the Interior Design.

The study consisted of two Phases. During Phase I, subjects were asked first to rate twenty upscale restaurant environments represented via black-and-white slides on a 7-point preference scale, and second to make relative rankings of the ten environmental attributes presented in pairs. During Phase II, which took place 19 days after the completion of Phase I, ratings for the presence of the ten attributes for each of the twenty environments were obtained from the original subjects.

Multiple regressions analyses indicated that attribute importance and attribute presence predict preference for the environment. The three groups ranked the attributes in a highly similar order of importance and subjects preferred the environments in a similar way. Designers disagreed with patrons and restaurant professionals on the perceived level of attributes present in the environments on several occasions. Comfort was unanimously the most important attribute in upscale restaurants. Findings supported the validity of conceptual frameworks established for landscape environments in predicting preference for environments with opportunities for prospect and refuge.

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CHAPTER 1

Introduction

Restaurant environments have provided interior designers with an increasing realm of creative projects. These projects, ranging from inexpensive fast food restaurants to upscale restaurants, have been relying on their design concepts to attract and keep their clientele.

Restaurant professionals agree that as competition increases, design is proving to be one of the restaurateur's most powerful tools and a prerequisite for success (Godfrey-June, 1994). Upscale restaurants in particular rely heavily on their design concepts to establish their trademark atmosphere and to attract customers (National Restaurant Association, 1989). In these higher-end environments, where design serves also as a marketing tool, everything is important--the food, the service, and the design (Godfrey-June, 1994). In restaurants, good design relies on two essential components: first, a highly functional floor plan and second, the use of the appropriate environmental attributes. This study will concentrate on the environmental attributes composing the interior environment of upscale restaurants.

The interior designer has the ability to manipulate and shape the interior environment and is responsible for its visual quality, aesthetic appeal and ultimately its ambiance. Environmental design elements or attributes interact to create the ambiance of the restaurant. These attributes include

levels of sensory stimulation, coherence, comfort, complexity, formality, mystery, novelty, privacy, spaciousness, and the presence or absence of natural elements such as plants, water and natural light. Variation of lighting, density and style of furniture, presence or absence of texture or patterns, and the degree of diversity of the elements present in the space can influence the perception of these attributes.

In upscale restaurants, the ambiance created by these environmental attributes becomes one of the determining factors which encourages a guest to come back to the restaurant in addition to menu selection and service (National Restaurant Association, 1989). Designers should therefore concentrate on using environmental attributes that are preferred by the majority of people to ensure a restaurant's success. This study focuses on the environmental attributes which influence preference in upscale restaurant environments.

Universally preferred attributes do exist. Some commonly preferred attributes are visual in nature and have been shown to predict preference in landscape environments (Herzog, 1987; S. Kaplan & R. Kaplan, 1982; Ulrich, 1977), residential environments (Nasar, 1983), as well as interior environments such as shopping malls (Kent, 1989), "corridors, lobbies and lounges, meeting rooms, offices, libraries and classrooms, cafeterias, restaurant bars, and dining rooms" (Scott, 1993, p.10). However, no study has specifically tested the validity of these attributes as predictors of preference in upscale restaurants. Despite their increasing success which is evidenced by

a total of \$275 billion in sales in the food industry in 1994 (Godfrey-June, 1994), restaurant environments have been overlooked by design oriented research.

Designers frequently create restaurant environments for end-users they do not know and frequently make assumptions regarding their needs, wants and preferences. Designers also frequently base their final design solutions upon their own preferences hoping and presuming that they will match those of the end-users. This becomes a problem because studies have shown that designers and laypersons or end-users do not evaluate the built environment in a similar way (Canter, 1969; Hershberger, 1970; R. Kaplan 1975). In other words, what the designer prefers and perceives as good and appropriate design is often not perceived the same way by the end-users.

Problem Statement

The study was conducted to investigate the ability of certain environmental attributes to predict preference in upscale restaurants as exhibited by three groups of subjects: the restaurant patrons, the restaurant professionals and the interior designers. Students from the Child and Family Studies department were chosen to represent the restaurant patrons or laypersons with no experience in restaurant administration or design, students from the Hotel and Restaurant Administration department were chosen to represent the restaurant professionals, and students from the Interior Design department were selected to represent the designers.

A first objective was to determine whether restaurant patrons,

restaurant professionals and interior designers assign the same degree of importance to ten environmental attributes. These attributes were: sensory stimulation, coherence, comfort, complexity, formality, mystery, nature, novelty, privacy and spaciousness.

A second objective was to determine whether the three groups agree on the perception of similar levels of attributes present in different upscale restaurant environments.

A third objective was to determine whether restaurant patrons, restaurant professionals and interior designers prefer the same upscale restaurant environments.

Finally, the study was also conducted to identify the relationship, if any, among the environments preferred, the importance of the attributes, and the presence of the attributes.

Significance of the Study

The purpose of this study was to determine which environmental attributes predict preference in upscale restaurants and if these attributes are the same for restaurant patrons, restaurant professionals, and interior designers. If designers know which specific attributes the end-users want, they will be able to prioritize these attributes and plan their budget accordingly. Furthermore, if designers know which attributes the end-users prefer, they will be able to create spaces that the end-users will not only be able to satisfactorily use but also enjoy. Knowledge gained from this study will

provide interior designers, architects and restaurant owners with useful information on how to provide for the needs and preferences of the patrons to improve the overall dining experience in upscale restaurants. Designers will be able to create upscale restaurants that will remain successful longer if they incorporate in the design solutions the environmental attributes which are conducive to the patrons well-being.

During Phase I of the study, preference ratings of twenty upscale restaurant environments represented via black-and-white slides as well as relative rankings for preference of environmental attributes were obtained from the three groups of subjects. During Phase II of the study, which took place 19 days after the completion of Phase I, ratings for the presence of the ten attributes for each of the twenty environments were obtained from the original subjects.

Three general hypotheses were based on the null perspective:

1. There will be no difference among the three groups of subjects on the relative rankings of the ten attributes in terms of importance. The three groups will rank the ten attributes in the same order of importance.
2. There will be no difference among groups on the presence of the ten attributes for each restaurant environment. The three groups will agree on the amount of attributes present in each environment.
3. There will be no difference among groups on the preference ratings of the restaurant environments. The three groups will prefer the same environments.

CHAPTER 2

Review of Relevant Literature

Several studies have concentrated on the relationship between preference and the visual environment during the past 25 years. These studies dealt with either the relationship between preference and natural environments (Appleton 1975; Balling & Falk, 1982; Herzog, 1987; Pedersen, 1978; Ulrich, 1977) or preference and urban environments (Herzog, R. Kaplan & S. Kaplan, 1976; S. Kaplan, R. Kaplan, & Wendt 1972; Nasar, 1983). Although studies focusing on interior environments have been conducted (Acking & Kuller, 1972; Canter, 1969; Pedersen, 1986), they did not necessarily look at the preference factor until recently (Dale, 1982; Kent, 1989; Scott 1992, 1993).

Additionally, several studies have examined the ability of several attributes to describe natural (Herzog, 1987; S. Kaplan, R. Kaplan & Wendt, 1972; S. Kaplan & R. Kaplan, 1982) and urban environments (Canter, 1969; Hershberger, 1970; Nasar, 1989). However, research concentrating on visual design attributes pertaining to the interior environment is more recent (Dale, 1982; Pedersen, 1986; Kent, 1989; Scott 1992, 1993).

Of the four basic environmental perception research paradigms--the expert, the psychophysical, the cognitive, and the experiential--(Taylor, Zube & Sell, 1987), the cognitive model is used most frequently in the development of theory regarding environmental preference (Scott, 1993; Kent, 1989).

The Cognitive Model

Environmental cognition is the study of the subjective information, visual images, impressions, and beliefs that people have of the environment (Moore & Golledge, 1976). Environmental cognition also includes the ways in which the conceptions arise from experience, and the ways in which they influence ensuing behavior with respect to the environment (Moore & Golledge, 1976). The cognitive model is based on the central concept that humans are creatures endowed with the ability to think. As thinking creatures, human beings not only respond passively to environmental stimuli, but they also choose those aspects of the landscape they consider as valuable (Taylor, Zube & Sell, 1987). Researchers of the cognitive model have been more concerned with the reason *why* landscapes are valued than with *what* landscapes are valued (Taylor, Zube & Sell, 1987).

Three theoretical perspectives explaining environmental preference have made essential contributions to the cognitive paradigm. These theoretical perspectives have been established by psychologist Daniel Berlyne, geographer Jay Appleton, and environmental psychologists Stephen and Rachel Kaplan. Berlyne's Arousal Theory (1974) is the only theoretical perspective which is based on aesthetic experience in relation to both traditional art works such as painting, music and sculpture, and non-traditional art works such as buildings. Both the Habitat and Prospect-Refuge Theories of Appleton (1975) and the Information Processing Model of the Kaplans (1982) are based on aesthetic experience in relation to landscapes.

Since these theoretical perspectives were found to explain preference in interior environments (Kent, 1989; Scott 1992, 1993), they will constitute the theoretical framework of this study.

The Arousal Theory of Berlyne

Berlyne is said to be the most influential contributor to the development of psychological aesthetics both empirically and theoretically (Wohlwill, 1976). Two central concepts, which are described below, emerge from Berlyne's work on environmental aesthetics: the concepts of "collative" properties of stimuli and the distinction between the "specific" and "diversive" explorations (Berlyne, 1960).

The Collative Properties of Stimuli

Berlyne (1960) asserts that a set of interrelated attribute stimuli related to uncertainty are determinant of spontaneous exploratory activity in humans as well as animals (as cited in Wohlwill, 1976). These attributes are composed of complexity, novelty, incongruity and surprisingness and are called "collative properties" (i.e. eliciting either implicit or explicit comparative responses). The tendency of the individual to engage in voluntary active exploration of a stimulus is proportional to the amount of uncertainty or conflict the stimulus generates. This tendency to explore will be highest for stimuli relatively rich in uncertainty i.e. collative properties (such as diversity, structural complexity, novelty, incongruity, surprisingness) (as

cited in Wohlwill, 1976). These collative properties do not explain aesthetic satisfaction however.

Aesthetic satisfaction is explained by the differentiation between two exploratory attitudes: *diversive* and *specific*.

Diversive and Specific Explorations

During diversive exploration, the individual searches for stimuli that will create some optimal level of stimulation and which will maintain him or her in a desirable state of arousal (as cited in Wohlwill, 1976). The stimulation will fall at some intermediary value with regard to the uncertainty contained in it whether considered in terms of novelty, diversity, surprisingness . . . (as cited in Wohlwill, 1976). Arousal occurs in both diversive and specific exploratory modes. However, in diversive exploration the activity is directed at an increase in arousal level beyond a low level whereas in specific exploration the activity is provoked by a high level of arousal, a state of conflict or uncertainty, and the activity is directed at lowering this level (as cited in Wohlwill, 1976). Findings indicate that aesthetic satisfaction stems from diversive arousal (as cited in Wohlwill, 1976).

In summary, Berlyne's arousal theory supports an optimal level of stimulus: too much stimulation is stressful and too little is boring. The relationship between aesthetic pleasure and stimulus can be represented by an inverted U-function (Berlyne, 1974). Aesthetic pleasure or preference increases with the uncertainty of the stimulus until the observer's arousal

level becomes unbearable at which point aesthetic pleasure decreases.

Stimulus uncertainty is defined by the “collative properties” of novelty, complexity, incongruity and surprisingness (Berlyne, 1974).

It was Wohlwill who adapted Berlyne’s Arousal Theory to landscape aesthetics (Wohlwill, 1976). Nevertheless, the validity of Berlyne’s perspective has been questioned because subsequent studies based on Berlyne’s work have yielded inconsistent results (Wohlwill, 1976). Although some degree of complexity seems to be preferred, it is possible that optimal levels of arousal are affected by individual, temporal or contextual differences (Wohlwill, 1976).

The Habitat and Prospect-Refuge Theories of Appleton

In his book The Experience of Landscape (1975), geographer Appleton attempts to discover what makes certain landscapes pleasurable to people. He envisions the human experience of landscape as being connected with man’s evolutionary heritage. He approaches the problem in a functional way. According to Appleton, if the environment is perceived as having potential to support human functioning, and therefore making survival more likely, the environment will be preferred. There are two central concepts that explain preference for landscapes in Appleton’s theory: the concept of habitat and that of prospect-refuge.

The Habitat Theory

Habitat theory asserts that the relationship between the human

observer and the perceived environment is basically the same as the relationship between a creature and its habitat: if the environment is perceived as a habitat, as a place which affords the opportunity for achieving simple biological needs (such as eating, drinking, sleeping, mating) the environment will be called "aesthetic." Satisfaction will be derived from its contemplation (Appleton, 1975). Similarly, if an environment does not satisfy human biological needs, it will be the source of anxiety and dissatisfaction. What is essential is not the actual potential of the environment to provide the necessities for survival, but its apparent potential as perceived immediately rather than rationally (Appleton, 1975). The environment will be preferred if it presents characteristics symbolizing environmental conditions favorable to survival regardless of whether they are favorable or not (Appleton, 1975). These favorable environmental conditions are achieved through specific combinations of colors, shapes, or spatial arrangements. The "smiling cornfields", the "browsing flocks" and the "limpid brooks" of the classical poets are symbolic examples of the types of environment in which the individual is more likely to survive (Appleton, 1975). This need for habitat originates back with our Stone Age ancestors who were forced to find environments which could protect them from the elements and ensure their survival (Appleton, 1975).

The Prospect-Refuge Theory

Appleton's prospect-refuge theory (1975) is also based on our ancestors'

behavior. Since they spent a major part of their time hunting, escaping predators, and exploring unknown territories, our ancestors were forced to interact with the environment strategically. They were required to develop the ability to see and hide in order to follow their prey safely and to estimate its survival prospects. The "prospect-refuge theory postulates that because the ability to see without being seen is an intermediate step in the satisfaction of many [of man's] biological needs, the capacity of an environment to ensure the achievement of this becomes a more immediate source of aesthetic satisfaction" (Appleton, 1975, p. 74). According to Appleton (1975), a landscape which offers both a good opportunity to see and a good opportunity to hide is aesthetically more satisfying than one which offers neither; also, the absence in prospect or in refuge can be compensated by the presence of the other. Therefore, environments that seem to provide the opportunity to see without being seen as well as a refuge are generally more preferred (Appleton, 1975).

The Information Processing Model of the Kaplans

The Kaplans suggest that, landscape preference is the result of an adaptation phenomenon which took place over years of evolution and which is connected with the basic human purpose of gathering and organizing information. The Kaplans' information processing model (1982), just like Appleton's model (1975), is derived from an evolutionary theory. As a product of evolution, man carries biases and tendencies that were required for survival millions of years ago (S. Kaplan, 1972). One of these biases concerns

the handling of information. The model predicts that humans will prefer environments which can fulfill two basic needs for information which are making sense and involvement. If these two basic needs of information are realized, humans will perceive the environment as one in which they will be more likely to survive and will therefore prefer it.

The Need for Information

Historically, man lived in a rather hostile environment and had to rely on his wits to survive. He was forced to develop the ability to anticipate danger well in advance to compensate for his smaller stature, as well as the ability to plan to overcome his ineffectiveness as a hunter. These anticipating and planning skills essential for survival favored the development of a larger information-handling capacity (S. Kaplan, 1972). The ability to predict became man's most important asset; prediction depends upon familiarity with the objects and situations characteristic of man's environment. "One must know what is happening, where one is in one's environment, before one can ascertain what might happen next" (S. Kaplan, 1972, p.30-6-1).

These two basic skills of recognition and prediction alone are not sufficient to determine what might happen next (S. Kaplan, 1972). The capacity to evaluate possible outcomes, and to select actions in a timely manner are necessary also. To carry out all these activities with adequate speed man has to be able to store and retrieve large quantities of information. Recognition, prediction, evaluation and speed of execution are interactive

skills humans need to process information provided by the environment.

Once the information is processed, it is stored in schematic groupings with shared characteristics. Each grouping represents a category of objects or situations which occur fairly frequently in man's environment (S. Kaplan, 1972). These groupings make possible the rapid recognition of familiar objects and situations and thereby form cognitive maps (S. Kaplan, 1972). These cognitive maps combined with the ability to evaluate possible outcomes facilitate the decision-making process. The cognitive maps and evaluative codes not only guide an individual's images and perception of the present and the future, but they also guide his or her choices, decisions and preferences (S. Kaplan & R. Kaplan, 1982).

Environments differ in how readily they can be understood and in how much interest they hold for humans. Since humans have a need to use and develop their cognitive mapping abilities, they tend to prefer environments that make such an activity possible. First, humans need information which allows them to make sense of their environment and second, they need to be able to acquire additional information or knowledge from that environment to feel involved in it.

Making Sense

People should prefer environments with qualities which aid in making sense of the information present. If a given environment has attributes which facilitate its comprehension, then a creature who likes to acquire large

amounts of information should prefer the environment. To be preferred an environment should present information which is easily identifiable and understandable; the environment should be coherent and legible.

Conversely, an environment presenting information which is ambiguous and not easily identifiable should be less preferred.

The opportunity to make sense of the environment is not enough for humans to prefer that particular environment (S. Kaplan & R. Kaplan, 1982). People prefer environments which display the opportunity to expand their horizon. People want to be involved in their environment and they like to be challenged by it, up to a certain point. People do not like to feel overwhelmed (S. Kaplan & R. Kaplan, 1982).

Involvement

The Kaplans' model forecasts high preference for scenes having attributes that facilitate perception and comprehension, or which convey to the observer an anticipation that additional information can be gained by a change in vantage point. These properties represent dimensions underlying preference, and are represented in the model by two component variables: complexity and mystery.

The Kaplans (1982) sustain that if people seek involvement, they will become more efficient at using their abilities to recognize and predict in uncertain circumstances. The Kaplans maintain that only unfamiliar settings can provide a certain level of challenge that involvement requires. In

unfamiliar settings, individuals will be more inclined to explore and thereby extend their cognitive maps.

In short, making sense and being involved appear as simultaneous needs in environmental perception. The needs for making sense and for involvement depend on the environment for their fulfillment. The environmental properties that support these needs can be identified as coherence, legibility, complexity and mystery, and provide a basis for understanding consistent patterns of environmental preference.

The Role of Familiarity

Familiarity plays an important part in cognition (S. Kaplan & R. Kaplan, 1982). It is well known that people prefer objects and situations they know and with which they are familiar. Familiar settings provide opportunities to use the cognitive maps that have already been developed. Making Sense in familiar environments is easy. However, it is also well known that familiarity breeds contempt. A paradox exists: the relationship between familiarity and preference is not straightforward.

The Role of Space

The Kaplans contend that space plays a central role in people's preferences for different kinds of environments (1982). A setting is not only something one perceives but also something one enters into. Individuals have to evaluate how they would function if they were to enter into the space and

move around in it. Therefore, the long range or more future aspect of preference depends on the interpretation of the inferred three dimensional space people have in front of them. Whereas, the short-range or more immediate aspect of preference involves only the two dimensional qualities of the scene or picture plane (S. Kaplan & R. Kaplan, 1982).

The Long-Range Future

The long range future has to possess mystery and legibility components in order to be preferred. In the Kaplans' model (1982), mystery refers to the impression that one could acquire new information if one were to travel deeper into the scene. One could learn more by moving and exploring. Legibility refers to the characteristic of the type of environment which is easy to make sense of, that one could explore without getting lost. Openness and the presence of landmarks are important to legibility.

The Immediate Environment

The immediate environment has to possess coherence and complexity in order to be preferred. Coherence concerns the issue of how easy it is to organize or structure the scene into identifiable units and how these units fit together. Coherence requires redundancy which makes the scene easier to figure out by allowing a whole area in the scene to be treated in a similar way. Complexity is concerned with whether there is enough present in the scene to keep one interested and enough going on that is worth making a cognitive

map of it.

People will prefer environments that are ordered or structured and therefore understandable, as well as environments which are rich in information and promote involvement. The Kaplans' model recognizes *coherence* and legibility as attributes essential to making sense of the environment and *complexity* and *mystery* as attributes relevant to involvement.

Similarities between the Models

The Kaplans (1982) see similarities between their Information Processing Model and Appleton's Prospect-Refuge Theory. According to the Kaplans, Appleton's theory can be talked about in terms of information. "An environment supportive of human functioning is one where one can gain information about what is going on and at the same time be able to prevent others from obtaining information about oneself" (S. Kaplan & R. Kaplan, 1982, p.90). Appleton's theory of prospect can be tied to the Kaplan's matrix of factors that predict preference. "Prospect, by ensuring visual access to the surrounding environment, suggests a setting in which learning can take place. It thus provides a striking parallel with mystery" (S. Kaplan & R. Kaplan, 1982, p. 91). The connection between Appleton's shelter and the Kaplans' making sense is not as obvious. "The common denominator is safety. An environment one can make sense of may not be exciting (although it can be), but it is likely to be one where one knows what to watch out for and what

to do. It is a setting one is familiar with. . . . It thus offers shelter in the metaphorical sense" (S. Kaplan & R. Kaplan, 1982, p. 91).

Validity of the Models for the Built-Environment

Researchers have demonstrated that the Kaplans' model was also valid for interior environments (Kent, 1989; Scott, 1993), although it was developed primarily for natural and urban environments. Part of the Kaplans' model was confirmed by research undertaken by Kent (1989) and Scott (1992,1993). Kent found evidence that a positive relationship existed between mystery and preference in shopping malls in his study investigating the role of mystery in preferences for shopping malls (1989). Scott's study confirmed the "hypotheses concerning preference for environments that are stimulating and involving, make sense, and include natural contents and balanced opportunities for 'prospect' and 'refuge' " (Scott, 1992, p.7).

As Scott and Kent demonstrated, just like landscapes, interiors need to respond to human needs for information. With regard to interiors, Dale (1982) found preference for public settings combining windows and enclosure, which support Appleton's theory that balance between opportunities for prospect and refuge is important (as cited in Scott, 1993). However, studies dealing with the design aspect of restaurant interiors are rare.

Restaurants Environments and Research

Restaurants have been overlooked in the design literature despite the

success they have enjoyed. The only researchers concerned with restaurant interiors are Burns and Caughey (1992) who examined the perceptual categories used by individuals in their first impressions of interior restaurant environments. They posited that it is the individuals' first impressions which will influence subsequent evaluations of spaces in daily life. However, Burns and Caughey's study did not investigate the preference dimension nor did it look at the visual elements associated with it. Therefore, it would be useful to determine if attributes preferred in shopping malls and public interior environments are also preferred in another very specialized interior environment: upscale restaurants.

Another problem encountered in the literature reviewed is the fact that laypersons and designers disagree in their perception and evaluation of the built environment.

Diverging Opinions of Designers and Laypersons

Research has also compared architects and laypersons in their evaluation of the built environment in addition to locating variables that are highly related to preference (Canter, 1969; Hershberger, 1970; Nasar, 1989). Research has shown that architects preferences differed from the public's preferences in architecture (Canter, 1969; Hershberger & Cass, 1974; Purcell, 1986). Hershberger's study (1970) sought to determine whether there was a correspondence between the meanings architects intend for buildings and the meanings laypeople attribute to them. He found evidence to the contrary.

Architects and laypersons do not understand buildings in a similar way. For instance, Hershberger found that thirty percent of the time when “architects would judge a building to be good, pleasing, beautiful, interesting, exciting, and unique, the non-architects would judge it to be bad, annoying, ugly, boring, calming, and common” (Hershberger, 1970, p.97).

R. Kaplan (1973) experienced a comparable outcome when examining the responses of architecture students, landscape architecture students and non-architecture or non-landscape architecture students to the outdoor environment. Coherence and mystery were both extremely important factors in understanding preference of a variety of physical environments; coherence made more difference for architects, while mystery played a more important role in determining preference for the untrained eye of the college student (R. Kaplan, 1973).

Such differences in opinion between laypeople and interior designers might also exist and could affect the success of the interior designer in communicating his or her true intentions.

Other Attributes Related to Preference

In addition to coherence, mystery and complexity, other variables have been found to be positively related to environmental preference. Openness, or spaciousness, has been found related to preference in many environmental settings (Nasar, 1983). Hull and Buhyoff (1983) found that distance to major topographic features, a component of spaciousness, was related to scenic

beauty as well. Spaciousness refers to those features that convey a feeling that the environment provides plenty of room to roam (Herzog, 1987).

It has been suggested that novelty also might play a role in environmental preference by Berlyne (1974) and Wohlwill (1976). However, since no independent measures of this particular attribute have been obtained, its ability to predict preference has not been confirmed (Wohlwill, 1976). Different variables have been used in the literature reviewed to define the attribute of novelty. Novelty has been defined by originality, unfamiliarity, and uniqueness (as cited in Wohlwill, 1976).

Sensory stimulation, comfort, formality and privacy were chosen as important attributes to consider in interior environments of restaurants as well because their validity to describe the built environment has been supported by previous research (Hershberger, 1972).

Sensory stimulation refers to the quality and intensity of environmental stimuli perceived through various sensory modalities (Gupta, 1988). Sensory stimulation also refers to a sense of aesthetic appeal.

Comfort includes the presence or absence of adequate luminous, acoustic, thermal and anthropometric properties of a setting (Gupta, 1988). Several factors such as temperature, lighting, ventilation and noise levels have been used to describe comfort by Hershberger (1972) as well.

Privacy refers to the extent to which the features of a setting allow an individual to control unwanted visual and acoustical stimuli from others (Gupta, 1988).

Finally, Dale (1982) found evidence that environments possessing elements such as plants, natural light, and curved surfaces were preferred over settings with hard or angular surfaces (as cited in Scott, 1993). Since the presence of natural elements seem to be preferred in interior environments, nature will be included as an attribute in the present study. Nature would be represented in the environment by the presence of plants, water and natural light.

The researcher expected the ten attributes previously discussed, *sensory stimulation, coherence, comfort, complexity, mystery, nature, novelty, spaciousness* and *privacy* to contribute separately and additively to explaining variations in subjects' preferences.

Techniques for Measuring Responses to Built-Environments

Two main data gathering methods have been used to measure responses to architectural spaces in the literature reviewed: the semantic differential technique, and the factor analysis technique.

The Semantic Differential Technique

The first method relies on the semantic differential technique developed by Osgood, Suci and Tannenbaum (1957). Researchers have subsequently used the semantic differential technique replacing the bipolar adjectives used in psycholinguistics and communications research (Osgood, Suci & Tannenbaum, 1957) with those more appropriate to the built

environment (Kasmar, 1970; Hershberger, 1972). This particular technique uses a number of scales that consist of bipolar adjectives such as "formal-informal" or "gloomy-bright". Responses that are based on each respondent's judgment will help discern the different attributes present in a particular environment. Each subject is requested to look at a scene (natural, urban, or interior environment represented by a picture or slide) and then place a check in the blank in which he/she feels the meaning of the attribute lies on the bipolar scale.

formal ____ : ____ : ____ : ____ : ____ : ____ : ____ informal

gloomy ____ : ____ : ____ : ____ : ____ : ____ : ____ bright

The scales are each divided into seven steps. If for instance the scale is formal-informal, the blank spaces would indicate respectively from left to right, extremely formal, quite formal, slightly formal, neither formal nor informal (or not applicable), slightly informal, quite informal, extremely informal. Scales and adjectives would differ to adapt to the subject material studied.

This method has been criticized by several researchers, although it has served as basis to studies that have yielded important information concerning the content of interior environments (Hershberger, 1972). For instance, R. Kaplan (1975) maintained that the semantic differential scale was limiting in

nature because it imposes a limited choice of adjectives onto the subjects thereby not describing all the dimensions of the environment adequately.

Danford and Willems (1975) expressed their concern and denounced the fact that every researcher using the semantic differential scale has employed a somewhat different content in their instrument, i.e. has used different adjectives, hence sacrificing the comparability of their results.

The Factor Analysis Technique

The second approach to studying the relationship between environmental preference and visual attributes relies on factor analysis (R. Kaplan, 1975). This approach involves obtaining preference ratings only from the subjects during a first phase, and having experts analyze the common attributes composing preference in a second and separate phase. This approach avoids problems associated with verbal assessments (S. Kaplan, R. Kaplan, & Wendt, 1972).

The present study will examine the preference ratings of three distinct groups of subjects to restaurant interiors. The first group represents the restaurant patrons coming to upscale restaurants the second group represents hospitality professionals who work in restaurant environments and the third group represents interior designers who shape restaurant environments.

During a first phase, affective responses were obtained from each group of subjects who were asked to rate a series of slides of upscale restaurant interiors on a preference scale. During the same phase, relative rankings of

attributes were obtained to establish the importance given by each group of subjects to the attributes. During a second phase, judgment of the presence of the visual attributes were obtained on the original slides from the same subjects, to understand the relationship between preference and the attributes composing the environment of upscale restaurants.

CHAPTER 3

Methodology

Subjects

The subjects selected for this study came from a convenience sample chosen from among the undergraduate student population of junior and senior standing in the College of Human Ecology at the University of Tennessee in Knoxville. Juniors and seniors were studied exclusively because they were considered to have had the most exposure to their respective profession and also will be professionals in the very near future.

Child and Family Studies students were chosen to represent the layperson or patrons coming to the restaurant, Hotel and Restaurant Administration students to represent future restaurant professionals and Interior Design students to represent future design professionals. Each group of subjects was therefore composed of students with the same major. Their participation in the study was totally voluntary.

Demographic information was collected from the participants during Phase I. Information concerning their age, gender, major, college standing and number of visits made to upscale restaurants as patrons and as employees was gathered. The frequency of visits made to upscale restaurants was thought to represent a familiarity factor susceptible to influence the subjects preference ratings.

Eighty-seven subjects (19 males and 68 females) participated in Phase I of the study. The majority was between the ages of 18 and 27. The sample included 27 Child and Family Studies students (1 male and 26 females), 30 Hotel and Restaurant Administration students (13 males and 17 females), and 30 Design students (5 males and 25 females).

Only 77 subjects (18 males and 59 females) out of the original 87 returned to participate in Phase II. There were 25 students from the Child and Family Studies department (1 male and 24 females), 26 students from the Hotel and Restaurant Administration department (12 males and 14 females) and 26 students from the Interior Design department (5 males and 21 females).

Instrumentation

Stimuli: Slides

Twenty-five black-and-white slides served as the stimuli for the study. Five slides representing office environments were presented first to the subjects as practice slides and twenty slides representing upscale restaurant environments were used as final slides. Even though data was gathered on the all the slides, analysis was performed on the data gathered on the final twenty slides only.

Practice Slides

Five black-and-white slides representing office interior environments were used as practice slides. These varied in content and were selected from a

pool of ten pictures which appeared in several trade magazines. The practice slides did not represent restaurant environments to avoid influencing the subjects in any way. Their purpose was to help the subjects anchor their judgment.

Restaurant Slides

Twenty black-and-white slides represented upscale restaurant environments. Due to time and budget constraints, the sample of environments came from pictures of upscale restaurant interiors found in trade magazines and books published within the last twelve years. Upscale restaurants featured in trade magazines and books exhibited more diverse interior environments than those available in the city of Knoxville. The original sample of pictures of restaurants consisted of 85 environments. Pictures exhibiting environments with low contrast, without a visible ceiling, not taken from a standing vantage point, or showing less than three clusters of tables were eliminated. Pictures exhibiting similar contents or pictures with food and/or people present were also rejected.

Only upscale restaurants were used for the study in order to control for purpose of outing and amount of dollar spent. The subjects were free to choose the reason they were eating out, based on the given amount of dollar spent. For this study, the subjects were told that a restaurant belonged to the upscale segment if its average bill for one person was equal to or above \$12.00, excluding the tip. This number was based on the data given by the National

Restaurant Association publications (National Restaurant Association, 1989).

Panel of Experts

A panel of experts was composed of two professors from the department of Interior Design and one professor from the department of Hotel and Restaurant Administration. They selected 20 environments to use for the study from a remaining pool of 35 usable pictures. Two environments were selected to represent each attribute. Ten attributes were studied: sensory stimulation, coherence, comfort, complexity, formality, nature, novelty, mystery, privacy, and spaciousness. These ten attributes were chosen because they were considered as essential to restaurant interior environments and also because most have been found to relate positively to environmental preference as part of existing research. These attributes will be explained in detail later.

The judges checked for slide quality, content and suitability. The slides included a range of variables that make up the visual environment. These variables included: variation of geometric shapes, furniture style, patterns, spatial organizations, textural qualities, spaciousness, lighting schemes, density of forms, and natural elements (such as natural light or plants)

Slide Making Process

Slides were chosen for this study because responses to scenes represented by slides have been found to be comparable to on-site responses to those scenes (Hershberger and Cass, 1974).

Furthermore, the color dimension was eliminated from those scenes on purpose because color has been shown to influence judgment due to the variance in the perception and preference of color by people (Scott, 1992).

The slide making process consisted of two stages since the processing of black-and-white slides was not readily available. During a first stage black-and-white prints of the original color pictures were made from a roll of TMAXX film at ASA 400.

During the second stage, slides were made from these black-and-white prints using a roll of Kodachrome T64. Prints and slides were both shot with a single lens reflex camera fitted with a macro lens, under the same light level.

Questionnaires

Two questionnaires were developed for the study, and they are described below.

Questionnaire 1

Part 1 of questionnaire 1 was developed to gather two types of data: the subjects preference ratings and demographic information.

To collect preference ratings, 25 7-point scales ranging from "1" meaning 'I do not prefer the environment' to "7" meaning " I prefer the environment very much" were listed. Each preference scale corresponded to each environment (5 practice slides and 20 final slides). In the second part of the questionnaire, subjects were requested to provide demographic information

such as gender, age, major, school standing, frequency of visits to restaurants as patrons, frequency of visits to restaurants as employees. These variables were thought to have a potential influence on the results.

The process for Part 2 of Questionnaire 1 was borrowed from De Long (1971) and was used to gather information on the relative rankings of the attributes. The ten attributes were presented in 45 different pairs. The subjects were asked to choose for each pairing the one attribute they valued most in upscale restaurants. Detailed definitions of the attributes were provided along with the pairings to eliminate ambiguity.

Pilot Study

A pilot study was conducted using six laypersons to Restaurant Administration and Interior Design to test the validity of the attributes definitions. These six individuals were asked to define each attribute using their own words and examples as needed. The results of the pilot study showed that the original definitions developed by past studies and discussed in the literature review had to be modified and detailed to be understandable by the layperson.

The final definitions used in this study read:

1. *Sensory Stimulation*: refers to an environment which is pleasing to the senses and contributes to a sense of joy or inspiration.
2. *Coherence*: the space is clearly organized, makes sense, and everything is where it belongs. It looks like it would be easy for you to find your way

around.

3. *Comfort*: refers to the light and noise levels you feel are appropriate in an environment. The seats are comfortable, and you have plenty of elbow and leg room. You would not mind being there for a certain period of time.

4. *Complexity*: refers to the variety of things and textures that you can look at from your present vantage point. There are enough things in the environment to keep you interested for a while. You feel like the environment is challenging and stimulating.

5. *Formality*: refers to a sense of ceremony, order. You expect certain materials to be there, everything is planned and should operate smoothly. The environment makes you feel like you would need to wear evening dress to go there.

6. *Nature*: the space has natural elements such as water, plants or natural light sources.

7. *Novelty*: the environment feels unique, original, and out of the ordinary.

8. *Mystery*: the environment appears intriguing and makes you feel like traveling deeper into it to explore it. You feel like you could encounter something new if you could move about and change your vantage point.

9. *Privacy*: refers to the features that are available in the environment to allow you to feel that you are isolated from others due to the lighting level or other visual or physical barriers.

10. *Spaciousness*: refers to the feeling that there is room to wander around, there are places to go, or the environment feels open.

Questionnaire 2

Questionnaire 2 was developed to gather presence ratings of the ten attributes for each slide. Therefore, each of the 25 environments (5 practice environments and 20 restaurant environments) were presented with 10 7-point scales, one for each attribute studied. Each scale ranged from "1" meaning "this attribute is not present at all in the environment" to "7" meaning "this attribute is very much present in this environment."

Data collection

Procedure

Other studies have asked students to rate for preference and attributes (Herzog and Kaplan, 1976) during a single phase. However, this study broke down the rating process into two phases to prevent the preference ratings from influencing the attribute rating process and contaminating the results. A nineteen day latency period was introduced between Phase I and Phase II to desensitize the subjects from the slides visual content.

Phase I

A total of 87 subjects participated in Phase I during which they were presented with 20 slides of restaurants interiors projected onto a 4'X 6' screen. They had 8 seconds to rate each one of them for preference on a 7-point Likert type scale (with "1" meaning "I do not prefer this environment at all" and "7"

meaning "I prefer this environment very much"). They were to record their responses on a questionnaire handed out to them before the study began (Appendix A).

The subjects were asked to evaluate the restaurant environments on their own criteria. They were reminded that they were evaluating upscale restaurants and that they would spend at least \$12.00 per person excluding tip in each one of the restaurants they were about to see. The subjects were asked not to consult their neighbors while participating to the study because the researcher was interested in obtaining their personal opinion. No further guidelines were provided so that students could choose their reason to dine out at an upscale restaurant.

As the study began, five practice slides representing office environments were shown to the subjects to familiarize them with the process and rating procedure. These practice slides did not represent restaurant interiors to avoid influencing the subjects in any way. The three groups of subjects were interviewed in different classrooms and at different times during Phase I. However, each group of subjects was interviewed in their original room for Phase II.

Once the preference ratings were completed, the participants were handed a second short questionnaire destined to uncover the attributes they value most among the ten attributes studied when they go to upscale restaurants (Appendix A). Subjects were instructed to read and familiarize themselves with a list of ten attributes (sensory stimulation, coherence,

comfort, complexity, formality, mystery, nature, novelty, privacy, spaciousness) and their detailed definitions. The subjects were then presented with 45 pairings of the ten attributes and were to circle for each pairing the one attribute they valued most when going to upscale restaurants (Appendix A). For instance, sensory stimulation was paired alternatively with coherence, comfort, complexity, formality, nature, novelty, mystery, privacy and spaciousness. Coherence was paired alternatively with comfort, complexity, formality, nature, novelty, mystery, privacy and spaciousness, and so forth for each attribute. Therefore, the maximum amount of times that each attribute could be chosen was nine times and the minimum was zero. The subjects were instructed to refer back to the definitions as often as necessary. This method used previously by De Long (1971) allowed the subjects to prioritize the attributes. This step was included to enable the researcher to interpret the preference data more accurately by establishing a relative ranking of the attributes for each group of subjects. Phase I lasted twenty minutes on the average.

Phase II

Phase II took place nineteen days after phase I for 62 subjects. Fifteen subjects had a longer latency period which lasted four more days and which was due to scheduling conflicts. Only 77 subjects returned and participated to Phase II. They were shown the original 20 slides in a new randomized order that remained the same for all subjects and were asked to rate each

environment on a 10-item 7-point unipolar attribute scale ranging from "1": "the attribute is not present at all in this environment", to "7": "the attribute is very much present in this environment" and record their ratings on a questionnaire (Appendix B). The participants were asked to rate the 20 scenes for sensory stimulation, coherence, comfort, complexity, formality, nature, novelty, mystery, privacy and spaciousness, in this order. Before Phase II began, they were handed a list of the ten attributes and their definitions. All the subjects had already read the list of attributes and their definitions during the Part 2 of Phase I (see list above). They were given time to reacquaint themselves with the definitions. Once again, to accustom the subjects with the new rating procedure, the researcher had them rate the original five practice slides which were presented in a new randomized order. They had one minute to rate each practice slide on the presence of the ten attributes. This rating time was adjusted and often increased to a minute and twenty seconds in order to let everybody evaluate each scene thoroughly. Phase II lasted 35 minutes on the average.

CHAPTER 4

Results

As described earlier, the study was conducted to identify those environmental attributes that influence preference in upscale restaurants as exhibited by restaurant patrons, restaurant professionals and interior designers. Sensory stimulation, coherence, comfort, complexity, formality, mystery, nature, novelty, privacy and spaciousness were the ten attributes being studied.

A first issue was to determine if restaurant patrons, restaurant professionals and interior designers assigned the same degree of importance to different environmental attributes. A second issue was to determine if restaurant patrons, restaurant professionals and interior designers prefer the same environments. A third issue was to determine if these three groups of subjects perceived the same levels of presence of different attributes in all the restaurant environments. Finally, the study was also conducted to identify the relationship, if any, among the importance of the attributes, the presence of the attributes, and the environments preferred.

Three general hypotheses were based on the null perspective.

1. There will be no difference among groups on the relative rankings of the ten attributes in terms of importance. The three groups will rank the ten attributes in the same order of importance.

2. There will be no difference among groups on the presence of the ten attributes in each slide. The three groups will agree on the amount of attributes present in each slide.
3. There will be no difference among groups on the preference ratings. The three groups will prefer the same environments.

It will be recalled that the study consisted of two phases separated by a nineteen-day latency period. During Part 1 of Phase I, subjects were asked to rate twenty upscale restaurant environments on a 7-point preference-scale with "1" meaning "I do not prefer this environment at all" and "7" meaning "I prefer this environment very much." During Part 2 of Phase I, the same subjects were presented with 45 different pairings of the ten attributes and were to select for each pairing the attribute they valued most in upscale restaurants. Relative rankings of the ten environmental attributes were thus established for each group. Finally, during Phase II, the same subjects came back and rated the original twenty upscale restaurant environments on a 7-point 10-item attribute scale with "1" meaning "the attribute is not present at all" and "7" meaning "the attribute is very much present."

The results of the study are presented in a different order as follows:

- (1) Results of the relative rankings of the ten attributes gathered during Part 2 of Phase I;
- (2) Results of the attribute presence ratings gathered during Phase II;
- (3) Results of the preference ratings of the upscale restaurant environments gathered during Part 1 of Phase I.

For all the statistical tests, a level of significance of .05 was chosen.

It will be recalled that the population size differed between Phase I and Phase II of the study. Eighty-seven subjects (27 restaurant patrons, 30 restaurant professionals, and 30 designers) participated in Phase I, whereas only 77 subjects (25 restaurant patrons, 26 restaurant professionals, and 26 designers) returned and participated in Phase II.

Relative Rankings of the Ten Attributes

During Part 2 of Phase I, subjects were presented with 45 different pairings of the ten attributes and were asked to circle the one attribute they value most out of each pairing for upscale restaurants. The maximum number of times that one attribute could be circled was nine times and the minimum was zero. Means were obtained for each group on the number of times that each attribute was selected. Rankings of the attributes for each group of subjects were then established from these means and are presented in Table 4.1 in descending order of importance.

During a first analysis, MANOVAs were performed on the attribute means to determine if the frequency of selection of each attribute differed across the three groups as well as within each group.

Testing for Differences in Attribute Means among Groups

Results from the MANOVA performed across groups indicate that only one attribute, comfort, was rated significantly differently by the three groups.

Table 4.1. Relative Rankings of the Attributes by Group and Overall

Patrons n = 27	Restaurant Professionals n = 30	Designers n = 30	Overall N = 87
1. Comfort $\bar{M} = 8.74$ a $SD = 1.45$	1. Comfort $\bar{M} = 7.33$ b $SD = 1.93$	1. Comfort $\bar{M} = 7.43$ b $SD = 1.81$	1. Comfort $\bar{M} = 7.83$ $SD = 1.84$
2. Privacy $\bar{M} = 6.44$ $SD = 2.53$	2. Spacious. $\bar{M} = 6.56$ $SD = 2.14$	2. Privacy $\bar{M} = 6.80$ $SD = 2.26$	2. Privacy $\bar{M} = 6.33$ $SD = 2.5$
3. Sens. Stim. $\bar{M} = 6.18$ $SD = 1.86$	3. Nature $\bar{M} = 6.46$ $SD = 2.62$	3. Nature $\bar{M} = 6.40$ $SD = 2.35$	3. Nature $\bar{M} = 6.23$ $SD = 2.5$
4. Nature $\bar{M} = 5.85$ $SD = 2.58$	4. Sens. Stim. $\bar{M} = 6.13$ $SD = 1.77$	4. Novelty $\bar{M} = 6.20$ $SD = 3.01$	4. Sens. Stim $\bar{M} = 5.87$ $SD = 1.73$
5. Spacious. $\bar{M} = 5.62$ $SD = 2.52$	5. Privacy $\bar{M} = 5.76$ $SD = 2.68$	5. Sens. Stim. $\bar{M} = 5.30$ $SD = 1.48$	5. Spacious. $\bar{M} = 5.75$ $SD = 2.63$
6. Novelty $\bar{M} = 5.33$ $SD = 2.57$	6. Novelty $\bar{M} = 5.36$ $SD = 2.65$	6. Mystery $\bar{M} = 5.23$ $SD = 2.82$	6. Novelty $\bar{M} = 5.63$ $SD = 2.75$
7. Coherence $\bar{M} = 4.81$ $SD = 2.16$	7. Coherence $\bar{M} = 5.13$ $SD = 1.96$	7. Spacious. $\bar{M} = 5.06$ $SD = 3.8$	7. Coherence $\bar{M} = 4.77$ $SD = 2.09$
8. Complex. $\bar{M} = 4.48$ $SD = 1.64$	8. Mystery $\bar{M} = 4.66$ $SD = 2.82$	8. Complex. $\bar{M} = 5.03$ $SD = 2.09$	8. Mystery $\bar{M} = 4.64$ $SD = 2.7$
9. Mystery $\bar{M} = 4.03$ $SD = 2.39$	9. Complex. $\bar{M} = 4.13$ $SD = 1.9$	9. Coherence $\bar{M} = 4.36$ $SD = 2.15$	9. Complex. $\bar{M} = 4.54$ $SD = 1.91$
10. Formal. $\bar{M} = 3.48$ $SD = 2.42$	10. Formal. $\bar{M} = 3.20$ $SD = 2.57$	10. Formal. $\bar{M} = 3.06$ $SD = 2.21$	10. Formal. $\bar{M} = 3.24$ $SD = 2.38$

Note. Means in the same row that do not share subscripts differ at $p < .005$ in the Tukey significant difference comparison.

"Sens. Stim." = Sensory Stimulation, "Spacious." = Spaciousness,

"Complex." = Complexity, "Formal." = Formality.

The Tukey comparison test was then used to determine that the restaurant patrons' mean for comfort ($M = 8.74$, $SD = 1.45$) was significantly higher than both the restaurant professionals' ($M = 7.33$, $SD = 1.93$) and the designers' ($M = 7.43$, $SD = 1.81$), $p < .05$. Comfort was the only attribute which presented means differing significantly among the three groups, $p < .005$. No statistically significant differences were found among the means of the other attributes across the three groups at $p < .05$.

Comfort was ranked as the most important attribute in upscale restaurants by the three groups. Privacy was ranked as the second most important attribute by both the patrons and designers. However, restaurant professionals differed in their choice by ranking spaciousness second and privacy fifth.

Nature was ranked as the third most important attribute by both restaurant professionals and designers. However, the patrons disagreed and chose sensory stimulation instead.

The three groups disagreed on the attribute they ranked fourth. Patrons selected nature, restaurant professionals sensory stimulation and designers novelty. While patrons ranked sensory stimulation and nature as third and fourth respectively, restaurant professionals did the exact opposite ranking them as fourth and third respectively.

All three groups also disagreed on the attribute they ranked fifth. Patrons selected spaciousness as their fifth most important attribute, whereas restaurant professionals selected privacy and designers selected sensory

stimulation.

While patrons ranked privacy second and spaciousness fifth, restaurant patrons did the opposite by ranking spaciousness second and privacy fifth.

Novelty was ranked as the sixth most important attribute by patrons and restaurant professionals. Patrons and restaurant professionals ranked novelty lower in importance as compared to designers who placed novelty as their fourth most important attribute. Designers placed mystery as sixth.

Coherence was seventh for both the patrons and restaurant professionals. Designers disagreed once again and chose spaciousness as their seventh most important attribute. Spaciousness seems to be of lesser importance to designers since they ranked it seventh whereas patrons ranked it fifth and restaurant professionals second.

Patrons and designers agreed on the eighth attribute and both picked complexity. Restaurant professionals differed in their choice and opted for mystery as their eighth most important attribute.

All three groups disagreed on the attribute they placed ninth. Patrons chose mystery, restaurant professionals complexity and designers coherence.

The three groups agreed however on selecting formality as their tenth attribute, making it the least important attribute.

A comprehensive graph showing the relationships that exist among the ratings of the attributes made by the three groups is presented in Figure 1.

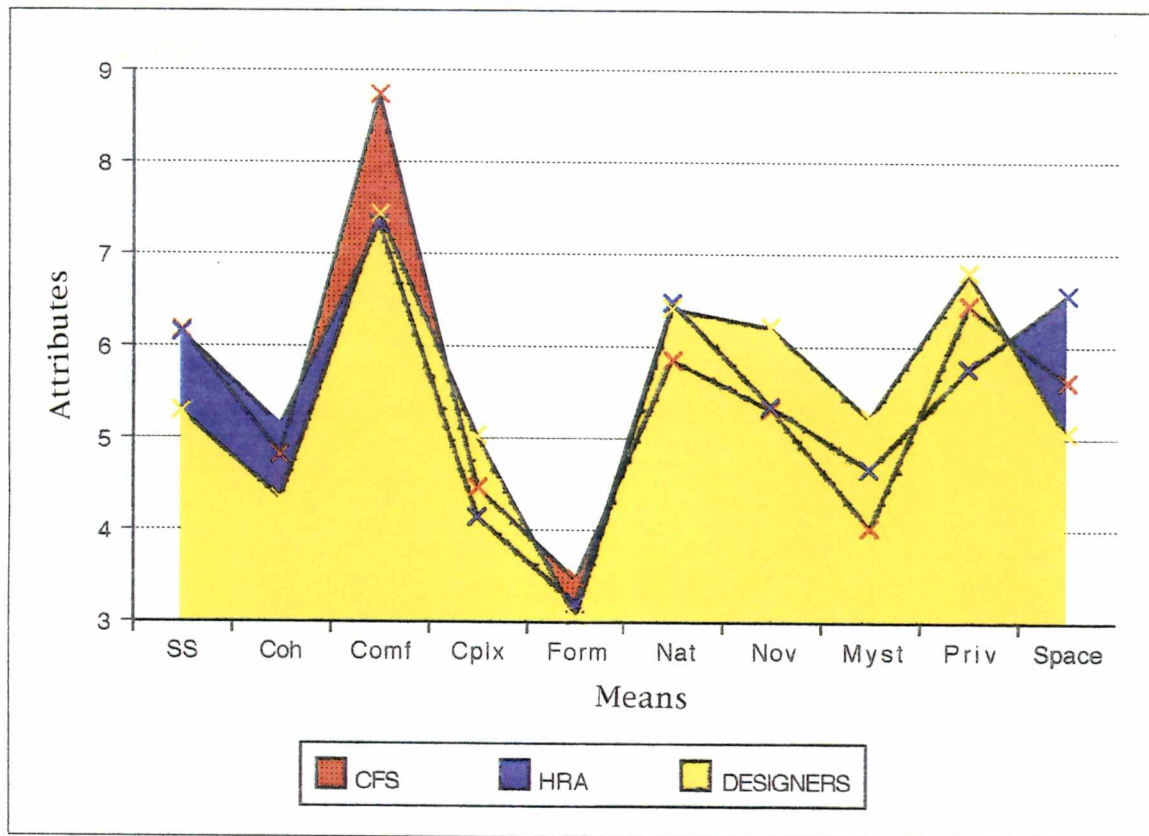


Figure 1. Frequency of Selection of the Attributes

Note. "SS" = Sensory Stimulation, "Coh" = Coherence
 "Comf" = Comfort, "Cplx" = Complexity
 "Form" = Formality, "Nat" = Nature
 "Nov" = Novelty, "Myst" = Mystery
 "Priv" = Privacy, "Space" = Spaciousness

Testing for Differences in Attribute Means within Group

A MANOVA was also performed on the attribute means within each group. The results are significant at the .05 level. They follow and are reported for each group.

Patrons ($n = 27, F = 11.69, df = 9, p = 2.E - 15$)

The mean for comfort was significantly higher than all other attribute means.

The mean for privacy was significantly higher than the means for complexity, mystery and formality.

The mean for sensory stimulation was significantly higher than the means for mystery and formality.

The means for nature and spaciousness were significantly higher than the mean for formality.

Restaurant Professionals ($n = 30, F = 8.47, df = 9, p = 3.- 11$)

The mean for comfort was significantly higher than the means for five attributes: privacy, novelty, coherence, mystery, complexity and formality.

The means for spaciousness, nature, and sensory stimulation were significantly higher than those of complexity and formality.

The means for privacy, novelty and coherence are all significantly higher than that of formality.

Designers ($n = 30$, $F = 8.57$, $df = 9$, $p = 2.E - 11$)

The mean for comfort was significantly higher than those of sensory stimulation, mystery, spaciousness, complexity, coherence and formality.

The means for privacy and nature were significantly higher than those for coherence and formality.

The means for novelty, sensory stimulation and mystery were significantly higher than the mean for formality.

Testing for Relationships among the Attribute Rankings

A second analysis was performed to determine if a correlation existed between the rankings established by the three groups of subjects. The Spearman rank correlation coefficient was computed to determine if a relationship existed between: (1) the order restaurant patrons and restaurant professionals ranked the attributes; (2) the order restaurant professionals and designers ranked the attributes; and (3) the order designers and restaurant patrons ranked the attributes.

The results are reported in Table 4.2.

Table 4.2 Correlation (Rho) Matrix of the Attributes as Ranked by Group

	Patrons	Restaurant Professionals	Designers
Patrons	-	.85*	.84*
Restaurant Professionals		-	.70*
Designers			-

Note. * $p < .05$, 1-tailed

A strong positive correlation exists between the ranking established by the patrons and that established by the restaurant professionals ($r_s = .85$).

A fairly strong positive correlation exists between the restaurant professionals' ranking and the designers' ranking ($r_s = .70$).

Another strong positive correlation exists between the designers' ranking and patrons' ranking ($r_s = .84$).

These results indicate that the relationship between the rankings of the patrons and restaurant professionals ($r_s = .85$) is as strong as the relationship between the designers and patrons ($r_s = .84$). In other words, when looking at two groups at a time, the patrons overall ranking is highly comparable to that of the restaurant professionals. Similarly the patrons overall ranking is highly comparable to the designers'. However, the restaurant professionals' ranking is not highly comparable to the designers' ranking ($r_s = .70$).

Presence of the Attributes

During Phase II, ratings of the presence of the ten attributes in the twenty restaurant environments were gathered. During a first analysis, MANOVAs were computed to determine if variables such as gender, age, school standing, frequency of visits as patrons and frequency of visits as employees had any effects on the attribute presence ratings. A MANOVA was also performed on the mean ratings of the ten attributes to determine if the three groups differed significantly in their perception of the level of attributes present in each environment. During a second analysis, a multiple regression was performed to determine if there was a relationship between attribute importance, attribute presence and environmental preference.

Results from the first MANOVA showed that variables such as gender, age, school standing, frequency of visits as patrons and frequency of visits as employees had no significant effects on the attribute presence ratings at the .05 level.

Testing for Differences in the Perceived Presence of Attributes

The results of the MANOVA indicate that the three groups differed significantly on the ratings of 6 environments ($p < .05$): environments 1, 3, 4, 11, 14, 19. The Tukey comparison test was used to determine where the significant differences lied. These six environments and the attributes perceived differently by the groups at $p < .05$ are presented next and are summarized in Table 4.3.

Table 4.3 Environments Differing Significantly on the Presence of One or More Attributes

Environ.		Patrons	Rest. Prof.	Designers	P.Value
Envir. 1 (6)					
	Formality	5.96 a b	5.33 b	6.07 a	0.027
	Sens. Stim.	4.08 a	4.11 a	3.07 b	0.002
	Complexity	3.48 a b	3.74 a	2.80 b	0.024
	Novelty	2.36 b	3.48 a	2.42 b	0.006
	Mystery	2.0 a b	2.81 a	1.84 b	0.017
Envir. 3 (20)					
	Comfort	3.52 a b	2.96 b	4.0 a	0.059
	Privacy	3.08 a b	2.85 b	3.84 a	0.046
Envir. 4 (3)					
	Formality	4.48 a b	4.92 a	4.08 b	0.039
	Sens. Stim	3.80 a b	4.44 a	3.56 b	0.042
	Complexity	3.56 b	4.66 a	3.48 b	0.0006
	Mystery	2.40 b	3.33 a	2.48 a b	0.02
	Spacious.	2.96 b	4.11 a	3.44 a b	0.012
Envir. 11 (4)					
	Comfort	3.48 a b	3.11 b	4.19 a	0.011
	Privacy	1.84 b	2.37 a b	2.84 a	0.0062
Envir. 14 (17)					
	Comfort	2.12 b	3.07 a b	3.50 a	0.007
Envir. 19 (2)					
	Comfort	6.2 a b	5.66 b	6.61 a	0.018
	Novelty	5.0 a	4.851 a	3.73 b	0.006
	Spacious	4.2 b	5.48 a	4.92 a b	0.008
	Privacy	2.6 b	3.33 a b	3.73 a	0.031

Note: The number of the environment corresponds to the presentation order for Phase I, the number in parentheses indicates the presentation order for Phase II.

Means in the same row that do not share subscripts differ in the Tukey significant difference comparison.

"Rest. Prof." = Restaurant Professionals

"Envir." = Environment, "Sens. Stim" = Sensory Stimulation,

"Spacious." = Spaciousness.

Environment 1:

Patrons, restaurant professionals and designers differed on the evaluation of five attributes: sensory stimulation, complexity, formality, novelty, and mystery.

Sensory stimulation: Designers ($M = 3.07$) saw significantly less sensory stimulation than patrons ($M = 4.08$) and restaurant professionals ($M = 4.11$), $p < .002$.

Complexity: Designers ($M = 2.8$) saw significantly less complexity than the restaurant professionals ($M = 3.74$), $p < .02$.

Formality: Restaurant professionals ($M = 5.33$) saw significantly less formality than Designers ($M = 6.07$), $p < .02$.

Novelty: Patrons ($M = 2.36$) and designers ($M = 2.42$) saw significantly less novelty than restaurant professionals ($M = 3.48$), $p < .006$.

Mystery: Designers ($M = 1.84$) saw significantly less mystery than restaurant professionals ($M = 2.8$), $p < .01$.

Environment 3:

The three groups differed on the evaluation of two attributes: comfort and privacy.

Comfort: Restaurant professionals ($M = 2.96$) saw significantly less comfort than designers ($M = 4.0$), $p < .05$.

Privacy: Restaurant professionals ($M = 2.85$) saw significantly less privacy than designers ($M = 3.84$), $p < .04$.

Environment 4:

The three groups differed on the evaluation of five attributes: sensory stimulation, complexity, formality, mystery, and spaciousness.

Sensory stimulation: Designers (M = 3.56) saw significantly less sensory stimulation than the restaurant professionals (M = 4.44), $p > .042$.

Complexity: Patrons (M = 3.56) and designers (M = 3.48) saw significantly less complexity than restaurant professionals (M = 4.66), $p < .0006$.

Formality: Designers (M = 4.04) saw significantly less formality than restaurant professionals (M = 4.92), $p < .03$.

Mystery: Patrons (M = 2.4) saw significantly less mystery than restaurant professionals (M = 3.33), $p < .02$.

Spaciousness: Patrons (M = 2.96) saw significantly less spaciousness than restaurant professionals (M = 4.111), $p < .012$.

Environment 11:

The three groups differed on the evaluation of two attributes: comfort and privacy.

Comfort: Restaurant professionals (M = 3.11) saw significantly less comfort than designers (M = 4.19), $p < .011$.

Privacy: Patrons (M = 1.84) saw significantly less privacy than Designers (M = 2.84), $p < .006$.

Environment 14:

The patrons and designers only differed on their evaluation of 1 attribute: comfort. Patrons ($M = 2.12$) saw significantly less comfort than designers ($M = 3.5$), $p < .007$.

Environment 19:

The groups differed on the evaluation of four attributes: comfort, novelty, privacy and spaciousness.

Comfort: Restaurant professionals ($M = 5.66$) saw significantly less comfort than designers ($M = 6.61$), $p < .018$.

Novelty: Designers ($M = 3.73$) saw significantly less novelty than patrons ($M = 5.0$) and restaurant professionals ($M = 4.85$), $p < .006$.

Privacy: Patrons ($M = 2.8$) saw significantly less privacy than designers ($M = 3.33$), $p < .031$.

Spaciousness: Patrons ($M = 2.96$) saw significantly less spaciousness than restaurant professionals ($M = 4.11$), $p < .008$.

In summary, the coherence and nature attributes did not pose any problems to the subjects. Comfort appeared as a source of disagreement on four occasions, privacy on three, novelty, formality, complexity, sensory stimulation and spaciousness on two occasions, and mystery on one occasion only.

Even though environment 19 was among the most preferred

environments overall, it was not perceived as possessing the same amount of attributes by the three groups of subjects. Two environments pertaining to the neutral preference category, environment 1 and environment 4, were sources of disagreement as well. Finally three environments pertaining to the low-neutral category, environments 14, 11, and 3, were perceived as possessing a significant different amount of attributes.

Among these six environments, only environment 14 yielded significant differences in mean ratings among the three groups during Phase I.

Restaurant professionals have consistently seen less comfort than designers, in four environments. Similarly, in three environments restaurant professionals and patrons have consistently perceived less privacy within the spaces than designers. On two occasions, patrons saw significantly less spaciousness in the restaurant environment than restaurant professionals. Patrons and designers perceived less mystery than restaurant professionals in two environments. Designers saw less sensory stimulation than restaurant professionals in two environments. On two occasions, patrons and designers perceived less complexity than restaurant professionals. All these differences were statistically significant at the .05 level.

Preference for the Twenty Restaurant Environments

During Part 1 of Phase I, the subjects were presented with twenty upscale restaurant environments and were asked to rate them on a 7-point

preference scale with “1” meaning “I do not prefer the environment at all” and “7” meaning “ I prefer the environment very much.” For this study, environments with scores ranging from 1.0 to 2.99 were not preferred, those with scores ranging from 3.0 to 4.99 were neutral or neither disliked nor preferred, and those with scores ranging from 5.0 to 7.0 were preferred.

A first analysis was conducted to determine if the three groups of subjects assigned the same preference score to all the environments. A MANOVA was used to determine if significant differences in the mean preference ratings existed among the three groups. Another MANOVA was used to determine if significant differences in preference ratings existed due to variables such as, gender, age, school standing, frequency of visits made to restaurants as a patron, or frequency of visits made to restaurants as an employee.

Rankings of the environments based on the preference means were established for each group of subjects. A second analysis was performed to determine if similarities existed among these rankings. The Spearman rank correlation coefficient was calculated to determine if a significant relationship existed between: (1) the order the restaurant patrons and restaurant professionals ranked the environments in terms of preference; (2) the order the restaurant professionals and the designers ranked the environments in terms of preference; (3) the order the designers and restaurant patrons ranked the environments in terms of preference.

Finally, a multiple regression analysis was performed to determine if

there was a relationship among the importance of the attribute, the presence of this attribute in the environment and the preference for the environment.

Testing for Differences in Preference Mean Ratings

Due to Gender, Age, Standing, Frequency of Visits to Restaurants

No statistically significant differences were found in the mean ratings based on the gender, standing, patron or employee variables. Statistically significant differences were found due to the age variable for three environments:

environment 5 ($p < .005$), environment 8 ($P < .019$), environment 9 ($p < .034$).

Testing for Significant Differences in Preference Ratings among Groups

There were significant differences on the mean preference ratings across the three groups. Nine environments were rated significantly differently across the three groups. The preference ratings for these nine environments are summarized in Table 4.4.

Patrons and restaurant professionals agreed on the preference ratings of fifteen slides out of twenty (or 75% of the slides).

Restaurant professionals and designers agreed on the preference ratings of eighteen slides out of twenty (or 90% of the slides).

Designers and patrons agreed only on the preference ratings of twelve slides out of twenty (or 60% of the slides).

Table 4.4. Environments with Preference Ratings Differing Significantly

Envir.	Patrons	Restaurant Prof.	Designers	P.Value
envir. 2	5.29 a	5.23 a	4.26 b	p=.014
envir. 5	6.11 a	3.66 b	5.63 a	p=.0001
envir. 6	4.22 b	5.36 a	5.43 a	p=.0036
envir.10	2.66 b	4.56 a	4.9 a	p=.0001
envir.12	2.7 b	3.8 a	4.56 a	p=.0001
envir.14	1.96 b	3.96 a	3.66 a	p=.0007
envir.16	4.62 a	3.9 a b	3.73 b	p=.017
envir.17	3.62 b	3.93 a b	4.7 a	p=.033
envir.20	5.81 a	4.83 a b	4.76 b	p=.034

Note. Means in the same row that do not share subscripts differ in the Tukey significant difference comparison.

Testing for Relationships among the Rankings

The results of the Spearman rank correlation indicate that positive relationships among the rankings established by each group do exist ($p < .05$, 1-tailed). They are reported in Table 4.5.

Even though the three groups differed on the preference ratings of certain environments, the significant positive correlations among the rankings indicate that the patrons' preference, the restaurant professionals' and the designers' overall preference for environments is the same.

Table 4.5 Correlation (Rho) Matrix of the Environments as ranked by Group

	Patrons	Restaurant Professionals	Designers
Patrons	-	.48*	.48*
Restaurant Professionals		-	.50*
Designers			-

Note. * $p < .05$, 1-tailed

The 20 restaurant environments have been ranked for each group and overall and are presented in descending order of preference in Table 4.6. Patrons preferred 5 environments, neither preferred nor disliked 12 environments and they did not prefer 3 environments. Restaurant professionals preferred only 2 environments and neither preferred nor disliked 18 environments. Finally, designers preferred 5 environments, the same number of environments as the patrons, and neither preferred nor disliked 15 environments. It will be recalled that for this study, environments with scores ranging from 1.0 to 2.99 were not preferred, those with scores ranging from 3.0 to 4.99 were neutral or neither disliked nor preferred, and those with scores ranging from 5.0 to 7.0 were preferred.

Table 4.6 Summary of the Rankings of the 20 Restaurant Environments in Descending Order of Preference by Group and Overall

Patrons	Restaurant Professionals	Designers	Overall
6.11 (<u>env 5</u>)	5.33 (<u>env 6</u>)	5.66 (<u>env 5</u>)	5.13 (env 8)
5.81 (<u>env 20</u>)	5.13 (<u>env 2</u>)	5.46 (<u>env 6</u>)	5.11 (<u>env 20</u>)
5.33 (env 8)	4.9 (<u>env 20</u>)	5.36 (env 7)	5.11 (env 19)
5.33 (env 19)	4.86 (env 8)	5.23 (env 8)	5.10 (<u>env 5</u>)
5.29 (<u>env 2</u>)	4.83 (env 19)	5.2 (env 19)	5.03 (<u>env 6</u>)
4.66 (env 7)	4.76 (env 7)	4.96 (<u>env 10</u>)	4.94 (env 7)
4.66 (env 4)	4.56 (env 4)	4.7 (<u>env 20</u>)	4.91 (<u>env 2</u>)
4.62 (<u>env 16</u>)	4.5 (<u>env 10</u>)	4.7 (<u>env 17</u>)	4.44 (env 4)
4.51 (env 1)	4.23 (env 9)	4.46 (<u>env 12</u>)	4.25 (env 13)
4.48 (env 13)	4.23 (env 1)	4.36 (<u>env 2</u>)	4.19 (env 1)
4.22 (<u>env 6</u>)	4.2 (env 13)	4.2 (env 18)	4.12 (env 9)
4.18 (env 9)	4.16 (env 18)	4.2 (env 15)	4.12 (env 18)
4.0 (env 18)	3.93 (<u>env 17</u>)	4.13 (env 4)	4.10 (<u>env 17</u>)
3.96 (env 3)	3.9 (<u>env 12</u>)	4.1 (env 13)	4.09 (<u>env 10</u>)
3.62 (<u>env 17</u>)	3.83 (<u>env 14</u>)	3.96 (env 9)	4.06 (<u>env 16</u>)
3.62 (env 15)	3.8 (<u>env 16</u>)	3.9 (env 3)	3.82 (env 15)
3.03 (env 11)	3.7 (env 11)	3.86 (env 1)	3.80 (env 3)
2.70 (<u>env 12</u>)	3.63 (<u>env 5</u>)	3.83 (<u>env 16</u>)	3.72 (<u>env 12</u>)
2.66 (<u>env 10</u>)	3.63 (env 15)	3.8 (<u>env 14</u>)	3.37 (env 11)
1.96 (<u>env 14</u>)	3.56 (env 3)	3.36 (env 11)	3.24 (<u>env 14</u>)

Note. The numbers enclosed in parentheses indicate the environment's presentation order during Phase 1.

Nine environments were rated significantly differently by the three groups in terms of preference: 2, 5, 6, 10, 12, 14, 16, 17, 20 ($p < .05$). They have been underlined. "env" = environment

scores between:

1-2.99: least preferred

3.0-4.99: neither disliked nor preferred

5.0-7.0: most preferred

Testing for a Relationship among Attribute Importance,

Attribute Presence, and Environment Preference

The results of the multiple regression analyses are summarized in Table 4.7. The importance of the attribute and the presence of that attribute do predict preference for the environment, for twelve environments out of twenty. The model represents a fairly appropriate way to predict preference in restaurant environments.

Table 4.7 Multiple Regression Analysis Summary Results

Environment	R-Square	F	P.Value
Envir. 1	.29	2.75	.006*
Envir. 2	.23	1.99	.048*
Envir. 3	.19	1.57	.13
Envir. 4	.14	1.12	.07
Envir. 5	.21	1.84	.07
Envir. 6	.38	4.06	.00023*
Envir. 7	.27	2.45	.015*
Envir. 8	.19	1.63	.11
Envir. 9	.10	.80	.63
Envir. 10	.20	1.69	.10
Envir. 11	.25	2.24	.02*
Envir. 12	.25	2.22	.026*
Envir. 13	.24	2.15	.032*
Envir. 14	.31	3.08	.008*
Envir. 15	.23	1.99	.04*
Envir. 18	.28	2.67	.008*
Envir. 19	.25	2.25	.024*
Envir. 20	.23	2.08	.038*

Note. * = statistically significant P-value
"Envir." = Environment

It will be recalled that during Phase I, preference ratings of twenty upscale restaurant environments were obtained on a 7-point Likert-type scale, with “1” meaning “I do not prefer this environment at all” and “7” meaning “I prefer this environment very much.” A preference score between 1.00-2.99 means that the environment was not preferred, a score between 3.00-4.99 means that the environment was neither preferred nor disliked, and a score between 5.00-7.00 means that the environment was preferred.

During Phase II, ratings were obtained on the presence of the ten attributes for all the environments. The ratings were also obtained on a 7-point scale, with “1” meaning “the attribute is not present at all” and “7” the attribute is very much present.” For this study, a score of 1.00-2.99 means that the attribute was not present, 3.00-4.99 means that the attribute was neither absent nor present, and 5.00-7.00 means that the attribute was present.

A summary of the ratings obtained during Phase I and Phase II follow, and are presented in Tables 4.E.1.1 to 4.E.20.3 along with a picture of the corresponding upscale environment, see Plates 1 to 20. The environments are presented in descending order of overall preference. For Phase II, only those attributes that were perceived to be present or absent are shown. Since the presentation order changed from Phase I to Phase II, both presentation orders are being summarized in Table 4.8. The new order for Phase II is indicated in parentheses for each environment. For all the following tables “Rest. Prof.” = restaurant professionals.

Table 4.8 Presentation Orders for Phase I and Phase II

Presentation Order for Phase I	Presentation Order for Phase II
1. Environment 8	1. Environment 16
2. Environment 20	2. Environment 15
3. Environment 19	3. Environment 2
4. Environment 5	4. Environment 1
5. Environment 6	5. Environment 12
6. Environment 7	6. Environment 19
7. Environment 2	7. Environment 7
8. Environment 4	8. Environment 3
9. Environment 13	9. Environment 11
10. Environment 1	10. Environment 6
11. Environment 9	11. Environment 18
12. Environment 18	12. Environment 8
13. Environment 17	13. Environment 5
14. Environment 10	14. Environment 9
15. Environment 16	15. Environment 14
16. Environment 15	16. Environment 10
17. Environment 3	17. Environment 20
18. Environment 12	18. Environment 13
19. Environment 11	19. Environment 4
20. Environment 14	20. Environment 17

Environment 8



Plate 1. Photograph of Environment 8

Phase I (Slide 8)

Table 4.E.1.1 Preference Ratings for Environment 8

	Patrons	Restaurant Prof.	Designers	Overall
Mean	5.33	4.86	5.23	5.13
SD	1.20	1.51	1.58	1.59

Note. Environment 8 was ranked first overall.

Environment 8 (continued)

Phase II (Slide 16)

Table 4.E.1.2 . Perceived Presence of Attributes in Environment 8

Attribute	Patrons	Rest. Prof.	Designers
Sens. Stim.	Present	Present	Present
Nature	Present	Present	Present
Complexity	Present	Present	Present
Comfort	Present	Present	Present
Novelty	Present	Present	
Coherence	Present	Present	
Formality	Present	Present	Present
Privacy		Absent	

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 20



Plate 2. Photograph of Environment 20

Note. From Restaurant Design (p. 63) by R. Alejandro, 1992
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Phase I (Slide 20)

Table 4.E.2.1 Preference Ratings for Environment 20

	Patrons	Restaurant Prof.	Designers	Overall
Mean	5.81 a	4.9 ab	4.7 b	5.11
SD	1.20	1.45	1.70	1.53

Note. Environment 20 was ranked second overall.
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 20 (continued)

Phase II (Slide 15)

Table 4.E.2.2 Perceived Presence of Attributes in Environment 20

Attribute	Patrons	Rest. Prof.	Designers
Nature	Present	Present	Present
Sens. Stim.	Present	Present	Present
Novelty	Present	Present	
Complexity	Present	Present	Present
Comfort	Present		
Coherence	Present		

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 19



Plate 3. Photograph of Environment 19

Note. From *Restaurant Design* (p. 64) by R. Alejandro, 1992
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Phase I (Slide 19)

Table 4.E.3.1 Preference Ratings for Environment 19

	Patrons	Restaurant Prof.	Designers	Overall
Mean	5.33	4.88	5.2	5.11
SD	1.67	1.40	1.74	1.61

Note. Environment 19 was ranked third overall.

Environment 19 (continued)

Phase II (Slide 2)

Table 4.E.3.2 Perceived Presence of Attributes in Environment 19

Attribute	Patrons	Rest. Prof.	Designers
Formality	Present	Present	Present
Coherence	Present		Present
Novelty	Present		
Spaciousness		Present	
Sens. Stim.		Present	
Complexity		Present	
Privacy	Absent		
Nature		Absent	Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

The three groups of subjects responded significantly differently on four attributes:

Table 4.E.3.3 Differences in Attribute Presence Ratings for Environment 19

Attribute	Patrons	Rest. Prof.	Designers
Comfort	6.2 ab	5.66 b	6.615 a
Novel	5 a	4.851 a	3.73 a
Spacious.	4.2 b	5.481 a	4.92 ab
Privacy	2.6 b	3.33 ab	3.73 a

Note. Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 5



Plate 4. Photograph of Environment 5

Phase I (Slide 5)

Table 4.E.4.1 Preference Ratings for Environment 5

	Patrons	Restaurant Prof.	Designers	Overall
Mean	6.11 a	3.63 b	5.66 a	5.10
SD	1.49	1.44	1.41	1.46

Note. Environment 5 was ranked fourth overall.

Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 5 (continued)

Phase II (Slide 1)

Table 4.E.4.2 Perceived Presence of Attributes in Environment 5

Attribute	Patrons	Rest. Prof.	Designers
Nature	Present	Present	
Sens. Stim.	Present	Present	Present
Formality	Present	Present	Present
Complexity	Present		
Comfort		Present	Present

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 6



Plate 5. Photograph of Environment 6

Note. From *Restaurant Design* (p. 35) by R. Alejandro, 1992
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Phase I (Slide 6)

Table 4.E.5.1 Preference Ratings for Environment 6

	Patrons	Restaurant Prof.	Designers	Overall
Mean	4.22 b	5.33 a	5.46 a	5.03
SD	1.12	2.15	1.27	1.90

Note. Environment 6 was ranked fifth overall.
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 6 (continued)

Phase II (Slide 12)

Table 4.E.5.2 Perceived Presence of Attributes in Environment 6

Attribute	Patrons	Rest. Prof.	Designers
Coherence	Present	Present	Present
Formality	Present	Present	
Spaciousness		Present	
Sens. Stim.			Present
Nature	Absent	Absent	Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 7



Plate 6. Photograph of Environment 7

Note. From *Hospitality Design* (p. 40) June 1992
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Phase I (Slide 7)

Table 4.E.6.1 Preference Ratings for Environment 7

	Patrons	Restaurant Prof.	Designers	Overall
Mean	4.66	4.76	5.36	4.94
SD	1.76	1.42	1.19	1.55

Note. Environment 7 was ranked sixth overall.

Environment 7 (continued)

Phase II (Slide 19)

Table 4.E.6.2 Perceived Presence of Attributes in Environment 7

Attribute	Patrons	Rest. Prof.	Designers
Comfort	Present	Present	Present
Nature	Present		Present
Sens. Stim.	Present	Present	Present
Spaciousness			Present
Coherence			Present
Mystery			Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 2



Plate 7. Photograph of Environment 2

Note. From Restaurant and Hotel Design International (p. 44) January 1991
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Phase I (Slide 2)

Table 4.E.7.1 Preference Ratings for Environment 2

	Patrons	Restaurant Prof.	Designers	Overall
Mean	5.29 a	5.13 a	4.36 b	4.91
SD	1.92	1.68	1.45	1.70

Note. Environment 2 was ranked seventh overall.
Means in the same row that do not share subscripts differ at $p < .05$ in the
Tukey significant difference comparison.

Environment 2 (continued)

Phase II (Slide 7)

Table 4.E.7.2 Perceived Presence of Attributes in Environment 2

Attribute	Patrons	Rest. Prof.	Designers
Formality	Present	Present	Present
Coherence	Present	Present	Present
Novelty			Absent
Mystery	Absent	Absent	Absent
Privacy	Absent	Absent	

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 4



Plate 8. Photograph of Environment 4

Note. From Restaurant and Hotel Design International (p. 56), February 1991
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Phase I (Slide 4)

Table 4.E.8.1 Preference Ratings for Environment 4

	Patrons	Restaurant Prof.	Designers	Overall
Mean	4.66	4.56	4.13	4.44
SD	1.64	1.62	1.04	1.45

Note. Environment 4 was ranked eighth overall.

Environment 4 (continued)

Phase II (Slide 3)

Table 4.E.8.2 Perceived Presence of Attributes in Environment 4

Attribute	Patrons	Rest. Prof.	Designers
Formality Coherence	Present	Present	Present
Privacy Mystery Novelty	Absent Absent	Absent	Absent Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

The three groups of subjects responded significantly differently on five attributes:

Table 4.E.8.3 Differences in Attribute Presence Ratings for Environment 4

Attribute	Patrons	Rest. Prof.	Designers
Formality	4.48 ab	4.92 a	4.08 b
Sens. Stim.	3.80 ab	4.44 a	3.56 b
Complexity	3.56 b	4.66 a	3.48 b
Space	2.96 b	4.11 a	3.44 ab
Mystery	2.4 b	3.33 a	2.48 ab

Note. Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 13



Plate 9. Photograph of Environment 13

Note. From *Restaurant Design* (p. 71) by R. Alejandro, 1992
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Phase I (Slide 13)

Table 4.E.9.1 Preference Ratings for Environment 13

	Patrons	Restaurant Prof.	Designers	Overall
Mean	4.48	4.2	4.1	4.25
SD	1.61	1.63	1.61	1.61

Note. Environment 13 was ranked ninth overall.

Environment 13 (continued)

Phase II (Slide 11)

Table 4.E.9.2 Perceived Presence of Attributes in Environment 13

Attribute	Patrons	Rest. Prof.	Designers
Complexity	Present	Present	Present
Sens. Stim.	Present	Present	
Nature	Absent	Absent	Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 1



Plate 10. Photograph of Environment 1

Note. From Restaurant Design (p. 128) by R. Alejandro, 1992
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Phase I (Slide 1)

Table 4.E.10.1 Preference Ratings for Environment 1

	Patrons	Restaurant Prof.	Designers	Overall
Mean	4.51	4.23	3.86	4.19
SD	1.64	1.94	1.66	1.99

Note. Environment 1 was ranked tenth overall.

Environment 1 (continued)

Phase II (Slide 6)

Table 4.E.10.2 Perceived Presence of Attributes in Environment 1

Attribute	Patrons	Rest. Prof.	Designers
Formality	Present	Present	Present
Coherence	Present	Present	Present
Mystery	Absent	Absent	Absent
Nature	Absent	Absent	Absent
Privacy		Absent	Absent
Novelty			Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

The three groups of subjects responded significantly differently on five attributes:

Table 4.E.10.3 Differences in Mean Attribute Presence Ratings for Environment 1

Attribute	Patrons	Rest. Prof.	Designers
Formality	5.96 ab	5.333 b	6.076 a
Sens. Stim	4.08 a	4.111 a	2.807 b
Complexity	3.48 ab	5.333 b	6.076 a
Novelty	2.36 b	3.481 a	2.423 b
Mystery	2 ab	2.81 a	1.846 b

Note. Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 9



Plate 11. Photograph of Environment 9

Note. From *Restaurant Design* (p. 133) by R. Alejandro, 1992
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Phase I (Slide 9)

Table 4.E.11.1 Preference Ratings for Environment 9

	Patrons	Restaurant Prof.	Designers	Overall
Mean	4.18	4.23	3.96	4.12
SD	1.60	1.49	1.30	1.47

Note. Environment 9 was ranked eleventh overall.

Environment 9 (continued)

Phase II (Slide 18)

Table 4.E.11.2 Perceived Presence of Attributes in Environment 9

Attribute	Patrons	Rest. Prof.	Designers
Complexity	Present	Present	Present
Sens. Stim.	Present		Present
Novelty	Present		
Formality			Present
Spaciousness	Absent		
Privacy	Absent		
Nature	Absent	Absent	Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 18



Plate 12. Photograph of Environment 18

Phase I (Slide 18)

Table 4.E.12.1 Preference Ratings for Environment 18

	Patrons	Restaurant Prof.	Designers	Overall
Mean	4.0	4.16	4.2	4.12
SD	1.48	1.66	1.45	1.70

Note. Environment 18 was ranked twelfth overall.

Environment 18 (continued)

Phase II (Slide 8)

Table 4.E.12.2 Perceived Presence of Attributes in Environment 18

Attribute	Patrons	Rest. Prof.	Designers
Spaciousness	Absent		
Privacy	Absent	Absent	
Nature	Absent	Absent	Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 17

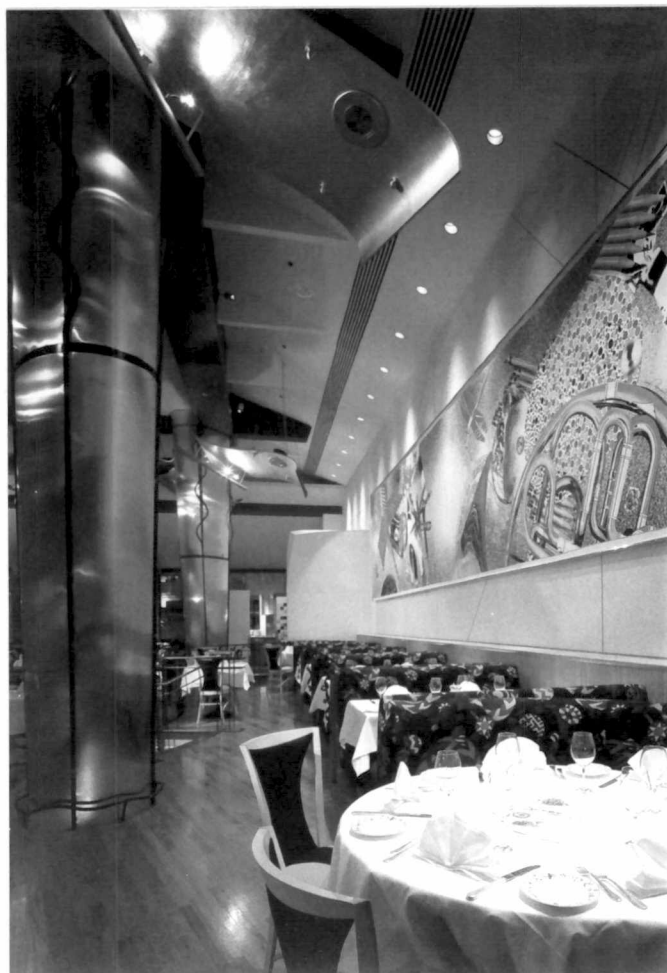


Plate 13. Photograph of Environment 17

Phase I (Slide 17)

Table 4.E.13.1 Preference Ratings for Environment 17

	Patrons	Restaurant Prof.	Designers	Overall
Mean	3.62 b	3.93 ab	4.7 a	4.10
SD	1.39	1.52	1.09	1.34

Note. Environment 17 was ranked thirteenth overall.
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 17 (continued)

Phase II (Slide 5)

Table 4.E.13.2 Perceived Presence of Attributes in Environment 17

Attribute	Patrons	Rest. Prof.	Designers
Complexity		Present	Present
Sens. Stim.			Present
Novelty		Present	
Nature	Absent	Absent	Absent
Privacy	Absent		

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 10

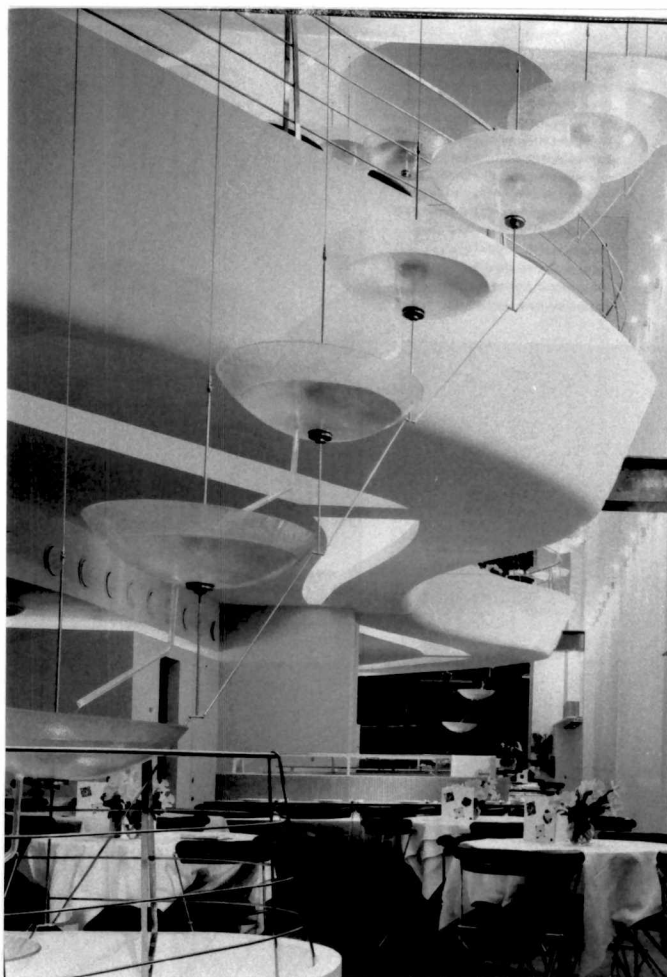


Plate 14. Photograph of Environment 10

Note. From Interiors, (p. 59) April 1992
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Phase I (Slide 10)

Table 4.E.14.1 Preference Ratings for Environment 10

	Patrons	Restaurant Prof.	Designers	Overall
Mean	2.66 b	4.5 a	4.9 a	4.09
SD	1.50	2.45	1.93	2.17

Note. Environment 10 was ranked fourteenth overall.
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 10 (continued)

Phase II (Slide 9)

Table 4.E.14.2 Perceived Presence of Attributes in Environment 10

Attribute	Patrons	Rest. Prof.	Designers
Novelty	Present	Present	Present
Complexity	Present	Present	Present
Mystery			Present
Sens. Stim.			Present
Nature	Absent	Absent	Absent
Privacy		Absent	

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 16



Plate 15. Photograph of Environment 16

Phase I (Slide 16)

Table 4.E.15.1 Preference Ratings for Environment 16

	Patrons	Restaurant Prof.	Designers	Overall
Mean	4.62 a	3.8 ab	3.83 b	4.06
SD	1.41	1.42	1.26	1.37

Note. Environment 16 was ranked fifteenth overall.
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 16 (continued)

Phase II (Slide 14)

Table 4.E.15.2 Perceived Presence of Attributes in Environment 16

Attribute	Patrons	Rest. Prof.	Designers
Nature Sens. Stim.	Present Present		
Privacy	Absent	Absent	Absent
Spaciousness	Absent	Absent	Absent
Mystery			Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 15



Plate 16. Photograph of Environment 15

Phase I (Slide 15)

Table 4.E.16.1 Preference Ratings for Environment 15

	Patrons	Restaurant Prof.	Designers	Overall
Mean	3.62	3.63	3.83	3.82
SD	1.14	1.44	1.01	1.26

Note. Environment 15 was ranked sixteenth overall.

Environment 15 (continued)

Phase II (Slide 10)

Table 4.E.16.2 Perceived Presence of Attributes in Environment 15

Attribute	Patrons	Rest. Prof.	Designers
Coherence	Present	Present	Present
Privacy	Absent	Absent	Absent
Spaciousness	Absent		
Nature		Absent	

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 3



Plate 17. Photograph of Environment 3

Note. From Restaurant and Hotel Design International, (p. 31) January 1991
New York, N.Y.: RHDi; Copyright 1991 by RHDi
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Phase I (Slide 3)

Table 4.E.17.1 Preference Ratings for Environment 3

	Patrons	Restaurant Prof.	Designers	Overall
Mean	3.96	3.56	3.9	3.80
SD	1.77	1.48	1.46	1.62

Note. Environment 3 was ranked seventeenth overall.

Environment 3 (continued)

Phase II (Slide 20)

Table 4.E.17.2 Perceived Presence of Attributes in Environment 3

Attribute	Patrons	Rest. Prof.	Designers
Complexity			Present
Novelty			Present
Sens. Stim.			Present
Formality	Absent		Absent
Comfort		Absent	
Privacy		Absent	
Nature			Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

The three groups of subjects responded significantly differently on two attributes:

Table 4.E.17.3 Differences in Attribute Presence Ratings for Environment 3

Attribute	Patrons	Rest. Prof.	Designers
Comfort	3.52 ab	2.963 b	4 a
Privacy	3.08 ab	2.851 b	3.84 a

Note. Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 12



Plate 18. Photograph of Environment 12

Note. From *Cafés* (p.49) by L. Dru and C. Aslan, 1988
New York, NY: Princeton Architectural Press
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Phase I (Slide 12)

Table 4.E.18.1 Preference Ratings for Environment 12

	Patrons	Restaurant Prof.	Designers	Overall
Mean	2.70	3.9	4.46	3.72
SD	1.33	1.50	.88	1.25

Note. Environment 12 was ranked eighteenth overall.

Environment 12 (continued)

Phase II (Slide 13)

Table 4.E.18.2 Perceived Presence of Attributes in Environment 12

Attribute	Patrons	Rest. Prof.	Designers
Coherence	Present	Present	Present
Mystery	Absent		
Spaciousness	Absent		
Privacy	Absent	Absent	
Nature	Absent	Absent	Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

Environment 11



Plate 19. Photograph of Environment 11

Note. From Restaurant and Hotel Design International, (p. 46) February 1992
New York, N.Y.: RHDI; Copyright 1992 by RHDI
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Phase I (Slide 11)

Table 4.E.19.1 Preference Ratings for Environment 11

	Patrons	Restaurant Prof.	Designers	Overall
Mean	3.03	3.7	3.36	3.33
SD	1.51	1.83	1.78	1.72

Note. Environment 11 was ranked nineteenth overall.

Environment 11 (continued)

Phase II (Slide 4)

Table 4.E.19.2 Perceived Presence of Attributes in Environment 11

Attribute	Patrons	Rest. Prof.	Designers
Novelty		Present	
Spaciousness	Absent		
Privacy	Absent	Absent	
Formality		Absent	Absent
Nature		Absent	Absent

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

The three groups of subjects responded significantly differently on two attributes:

Table 4.E.19.3 Differences in Attribute Presence Ratings for Environment 11

Attribute	Patrons	Rest. Prof.	Designers
Comfort	3.48 ab	3.11 b	4.192 a
Privacy	1.84 b	2.37 ab	2.84 a

Environment 14

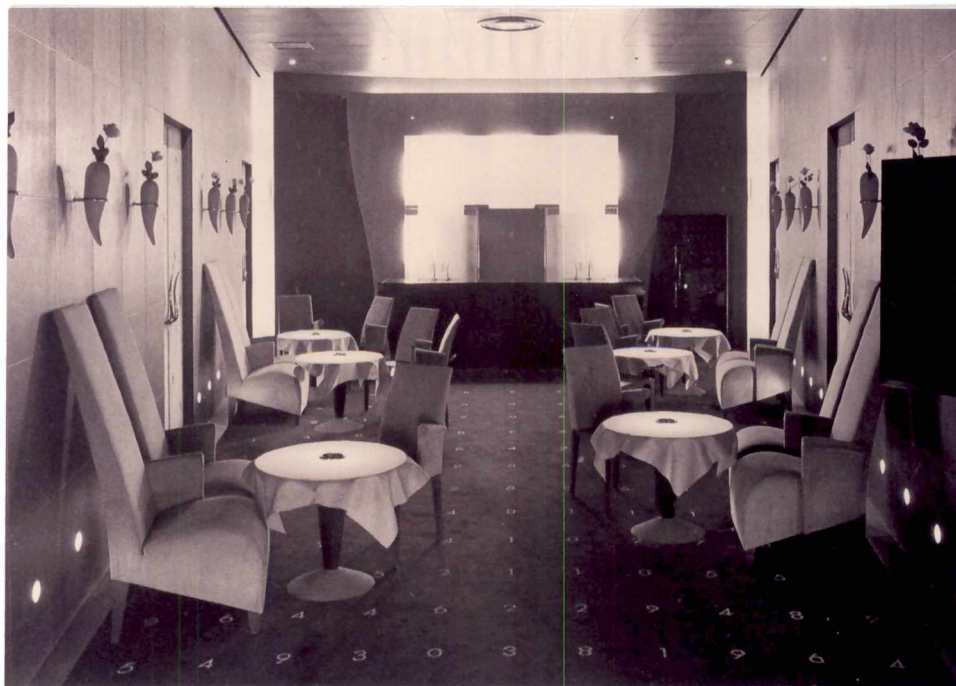


Plate 20. Photograph of Environment 14

Note. From Hospitality Design, (p.58) September 1992
New York, N.Y.: HD; Copyright 1992 by HD
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Phase I (Slide 14)

Table 4.E.20.1 Preference Ratings for Environment 14

	Patrons	Restaurant Prof.	Designers	Overall
Mean	1.96 b	3.83 a	3.8 a	3.24
SD	1.49	1.62	1.81	1.70

Note. Environment 14 was ranked twentieth overall.
Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant difference comparison.

Environment 14 (continued)

Phase II (Slide 17)

Table 4.E.20.2 Perceived Presence of Attributes in Environment 14

Attribute	Patrons	Rest. Prof.	Designers
Novelty		Present	Present
Complexity	Absent		
Formality	Absent		
Sens. Stim.	Absent		
Spaciousness	Absent		
Comfort	Absent		
Nature	Absent	Absent	Absent
Privacy		Absent	

Note. Only the most and least present attributes are shown. Neutral scores were omitted. The attributes are ranked according to the patrons' responses from most present to least present.

The three groups of subjects responded significantly differently on one attribute:

Table 4.E.20.3 Differences in Attribute Presence Ratings for Environment 14

Attribute	Patrons	Rest. Prof.	Designers
Comfort	2.120 b	3.074 a b	3.5 a

Note. Means in the same row that do not share subscripts differ at $p < .05$ in the Tukey significant comparison.

Chapter 5

Conclusions

As previously stated, this study was conducted to investigate the ability of ten environmental attributes (sensory stimulation, coherence, comfort, complexity, formality, mystery, nature, novelty, privacy and spaciousness) to predict preference in upscale restaurants as exhibited by three groups of subjects: the restaurant patrons, the restaurant professionals and the interior designers. The purpose of this study was to determine which environmental attributes predict preference in upscale restaurants and if these attributes are the same for restaurant patrons, restaurant professionals, and interior designers.

The study consisted of two phases. During Part 1 of Phase I, subjects were asked to rate twenty upscale restaurant environments represented via black-and-white slides on a 7-point preference scale. During Part 2 of Phase I, subjects were asked to make relative rankings of the ten environmental attributes presented in pairs. During Phase II, which took place 19 days after the completion of Phase I, ratings for the presence of the ten attributes for each of the twenty environments were obtained from the returning subjects.

The conclusions are discussed in the following order:

(1) Relative rankings of the attributes, (2) Presence of the attributes in the environments and (3) preference ratings for the environments.

Relative Rankings of the Attributes

Comfort, which was defined as *“appropriate noise and light levels, appropriate amounts of leg and elbow room as well as comfortable seats,”* is the most important attribute according to all three groups. It is especially important to the restaurant patrons who ranked it significantly higher than restaurant professionals and designers. Comfort was ranked significantly higher than the nine other attributes by the patrons. Comfort, according to the patrons, is the essential component of a pleasurable dining experience. Therefore, if designers were faced with the situation of providing for only one attribute, then comfort should be the focus. However, providing for comfort only might not be sufficient for patrons to return to an upscale restaurant. Privacy is also an important attribute to consider since the restaurant patrons ranked it as second most important. Privacy was defined as *“features which allow individuals to be isolated from others due to the lighting level or other visual or physical barriers.”* Patrons ranked sensory stimulation as their third most important attribute not very far behind privacy. Sensory stimulation was described as *“referring to an environment pleasing to the senses and contributing to a sense of joy or inspiration.”* By choosing privacy and sensory stimulation among their top three most important attributes in upscale restaurants, patrons confirmed Appleton’s theory which states that people will prefer environments which offer simultaneous possibilities of refuge and prospect. In this case, privacy would satisfy the patrons’ need for refuge while sensory stimulation could satisfy part of the patrons need for

prospect. The patrons need for prospect would only be fulfilled in part by the sensory stimulation attribute because although sensory stimulation refers to properties that make the environment pleasing to the senses, it does not necessarily convey the idea that the opportunity for prospect is available. Therefore, the creation of large open dining rooms should be avoided at all cost, if designers want to provide for what the patrons value.

It appears as though the designers understand the patrons needs because just like them, they picked comfort and privacy as their top two most important attributes. Therefore, designers are aware of what the patrons value in upscale restaurants and should be able to provide for their most important needs; but it is also quite likely that designers see themselves as patrons too.

Comfort is without a doubt very important to restaurant professionals as well. If the patrons feel comfortable, they will be more likely to remain longer in the restaurant, they will spend more money on food, and they will recommend the restaurant to their friends. However, the needs of the restaurant professionals differ from those exhibited by the patrons and the designers. Restaurant professionals do not value privacy since they picked spaciousness as their second most important attribute and placed privacy as fifth, contrary to the patrons who ranked privacy and spaciousness in the exact opposite order. The restaurant professionals' choice for ranking privacy fifth and spaciousness second could be interpreted in the context of their work.

Restaurant employees need visual access to the patrons to be able to anticipate the patrons needs. The patrons needs are often conveyed by subtle cues such as an empty glass, an empty plate, or a patron's posture. These implicit cues can only be perceived by the wait staff if visual access to the patrons exists. Restaurant managers also need to be able to see the dining room for supervision purposes. Privacy devices in restaurant environments would pose a challenge to restaurant professionals and would prevent them from seeing and attending to the patrons properly. This need for spaciousness can be interpreted therefore in terms of Appleton's Prospect-Theory and the Kaplans' Information Processing Model. Spaciousness can be seen as the perfect opposite of privacy. Spaciousness refers to the feeling that "*there is room to wander around, and that the environment feels open.*" Spaciousness could therefore offer to the restaurant professionals a better view of their surroundings which they need in their job. Spaciousness, provides them with the ability to see or what Appleton calls prospect. The ability to see or the existence of prospect is essential to the restaurant professionals in order to anticipate patrons' needs. A spacious environment might also be easier to understand, or as the Kaplans would say: more legible. Legibility is one of the components of the Kaplans' Information Processing Model. According to the Kaplans, environments that are coherent and legible as well as rich in information and promoting involvement are generally more preferred.

Nature is also fairly important to all three groups since it is either ranked fourth (by the patrons) or third (by both restaurant professionals and

designers). Nature was expected to be ranked among the top most important attributes by all three groups in light of several studies which have shown that natural elements were preferred in interior environments (Dale, 1982; Scott, 1992). Designers especially were expected to rank nature high on importance. Designers are taught early in their curriculum about the effects of the environment and its content on people's well being and behavior. Therefore, including elements with relaxing powers such as plants and natural light should be a priority for designers.

Sensory stimulation was important to the patrons who ranked it third and to the restaurant professionals who ranked it fourth. Sensory stimulation was only fairly important to the designers who ranked it fifth and ranked novelty fourth. The designers' choice came as a surprise. Sensory stimulation was expected to be ranked higher by the designers whose job is to make environments aesthetically attractive. However, the fact that they value novelty instead of sensory stimulation is not surprising. Designers often think of novelty as being synonymous with creativity. Some of them often think that the two concepts are interchangeable, forgetting that novelty does not serve a purpose and is not meaningful as compared to creativity.

Four attributes were consistently at the bottom of the rankings. Coherence, complexity, mystery , and formality were among the least important attributes in general. Coherence was not important for the patrons or for the restaurant professionals who ranked it seventh. Coherence was even less important to the designers who ranked it ninth. The patrons'

response is quite understandable. They are going to an upscale restaurant to enjoy their dining experience. They have no immediate need for coherence. As soon as a table is available the host or hostess will show them to their table, thus eliminating the need for them to make sense of the environment. The restaurant professionals' and the designers' responses are a little more surprising however. One would expect coherence to be of utmost importance to the restaurant professionals and to the designers. Coherence in the environment would after all only facilitate the restaurant professionals' job. Coherence also seems to be a fundamental element that designers need to incorporate in their design solutions for their work to be comprehensible by the end-users.

Finally, all groups agreed and ranked formality as the least important attribute in upscale restaurants. This common response contradicts the concept of upscale restaurants. Such a reaction might be explained by the age of the subjects; the majority of the subjects was between 18 and 27 years old. The new generation may not value formality as an older population might.

In summary, emphasis should be given to the needs of the patrons because they represent the primary end-users of upscale restaurants. patrons consider comfort, privacy, sensory stimulation and nature as important attributes in upscale restaurants. They require a restaurant environment which is comfortable and which allows them to have privacy. They also want the environment to be conducive to a pleasant dining experience by possessing a certain level of sensory stimulation and natural

elements. Apparently their need for complexity and mystery are not as fundamental in upscale restaurant environments as they were in other public interior environments (Kent, 1989; Scott, 1992).

In addition, this study shows that designers seem to be able to provide better for the needs of the restaurant patrons than for the needs of the restaurant professionals. Designers have to keep in mind that restaurant professionals are end-users of restaurant environments also and that they should provide for their needs as well. Specifically, designers should plan more spacious environments to accommodate the restaurant professionals' request.

The statistically significant relationships found among the rankings of the attributes in terms of importance indicate that patrons, restaurant professionals and designers value the attributes in a highly similar order of importance. However, one should keep in mind that the subjects were forced to make choices among pairings of attributes and that their answers might have been highly emotionally based.

Presence of the Attributes in the Environments

Although designers value the ten attributes studied in a highly similar order of importance as patrons and restaurant professionals, their perception of the presence of these attributes differed on several occasions during the study. What the designers perceived as comfortable or private was not perceived as such by the patrons or restaurant professionals. For instance,

restaurant professionals have consistently seen significantly less comfort than designers, in four environments. Similarly, restaurant professionals and patrons have consistently perceived significantly less privacy within three environments than designers. Patrons and designers perceived less mystery and less complexity than restaurant professionals in two environments, and designers saw less sensory stimulation than restaurant professionals in two environments. These findings echo those of previous research by Hershberger (1970) or R. Kaplan (1975). These studies have shown that architects (or designers) and laypersons do not agree on the attributes of the environments they perceive as appropriate. The present study has obtained patterns indicative of this trend. Therefore, designers need to be aware of these tendencies if they want to mold spaces that the end-users will perceive as successful.

Preference Ratings

Gender, age, school standing and familiarity with upscale restaurant environments did not influence the preference ratings. Results indicated that the three groups of subjects tend to prefer the environments according to a same general pattern since they exhibit fairly similar preference rankings. However, results obtained in Phase II point to the fact that the three groups of subjects might not prefer these environments for the same reasons. Their preference ratings are driven by the presence of different attributes in the environment.

For instance, patrons prefer environments that have higher levels of nature and comfort as exhibited by environments 20, 5, and 8. Nature is represented by luxurious plants, tall trees, long skylights, and comfort is represented by large chairs padded with large cushions. The patrons highly preferred two restaurant environments that were highly traditional and formal representing historical interiors reminiscent of those found in 19th Century America or 16th Century France. Patrons therefore contradicted themselves since they ranked formality as their least important attribute and still preferred environments that are highly formal.

It appears as if patrons would be willing to settle for lesser amounts of privacy if the environment provides at least three or four attributes that they value.

Attributes preferred by restaurant patrons are harder to discern from their preference ratings. There were only two environments that they really preferred and their appearance was very different: one had a very contemporary feel (environment 6) while the other had a more traditional and historical feel (environment 2). Spaciousness seems to be the attribute driving their preference which is independent of style. Looking at their ratings, when spaciousness was rated high, novelty and complexity tended to be rated high also. If they think of the environment as spacious, they will consider them as more novel and also more complex than patrons and designers will.

Designers know that they have to provide for comfort, privacy, and

nature. Their most important attributes match somewhat those of the patrons. Novelty to them is more important than it is to patrons or restaurant professionals. The attribute of sensory stimulation is rated higher for those environments exhibiting strong architectural features coming from the lines of the ceilings, walls or furniture. Designers rate those environments they consider novel higher on preference than the patrons as exhibited by their ratings obtained for environments 17, 6, 10 and 14. Environments 10, 9 and 3 were rated higher by designers due to higher levels of complexity and novelty. Overall, environments exhibiting higher levels of coherence only were neither preferred nor disliked.

In summary, designers should provide for comfort in upscale restaurants. Patrons and restaurant professionals exhibit different needs. Patrons want privacy and some sensory stimulation, while restaurant professionals want spaciousness or prospect opportunities. Designers have to provide for the needs of two types of end-users. Even though patrons are the primary users, the restaurant professionals contribute to the overall functioning of the dining environment and their opinions should not be neglected. To accommodate both patrons and restaurant professionals, a balance between privacy and spaciousness or as Appleton puts it prospect and refuge is needed, in order to make the environment universally preferred.

Designers also have to keep in mind that although they might prefer the same environments as the end-users, they might not prefer them for the

same reasons. Preference is driven by the combination of different attributes for the three groups. However, if three or four attributes considered important by each group are included in the final design solution, then one important attribute can be less apparent and the environment will still be preferred by most people.

Further study is needed to determine if the results are applicable to the practicing restaurant professionals and designers, as well as older patrons.

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APPENDICES

Appendix A

Questionnaires for Phase I

Phase I (Part 1)

You will be presented with a series of slides representing interior environments. Please indicate your preference for each environment represented in the following slides, by using a scale ranging from 1 to 7, with "1" meaning "I don't prefer the environment at all" and "7" meaning "I prefer the environment very much." If your preference is neither very low nor very high, then "4" would be the appropriate response.

First, to familiarize you with the process and the rating procedure, five practice slides will be presented to you. Please feel free to ask questions if you do not understand the procedure.

Practice slides:

Environment 1:	not at all	1	2	3	4	5	6	7	very much
Environment 2:	not at all	1	2	3	4	5	6	7	very much
Environment 3:	not at all	1	2	3	4	5	6	7	very much
Environment 4:	not at all	1	2	3	4	5	6	7	very much
Environment 5:	not at all	1	2	3	4	5	6	7	very much

The following slides represent interior environments of upscale restaurants.

Please indicate how pleasing you find the environment represented in the following slides, how much you prefer it by using a scale ranging from 1 to 7, with "1" meaning "I don't prefer it at all" and "7" meaning "I prefer it very much."

If your preference is neither very low nor very high, then "4" would be the appropriate response.

Environment 1:	not at all	1	2	3	4	5	6	7	very much
Environment 2:	not at all	1	2	3	4	5	6	7	very much
Environment 3:	not at all	1	2	3	4	5	6	7	very much
Environment 4:	not at all	1	2	3	4	5	6	7	very much
Environment 5:	not at all	1	2	3	4	5	6	7	very much
Environment 6:	not at all	1	2	3	4	5	6	7	very much
Environment 7:	not at all	1	2	3	4	5	6	7	very much
Environment 8:	not at all	1	2	3	4	5	6	7	very much
Environment 9:	not at all	1	2	3	4	5	6	7	very much
Environment 10:	not at all	1	2	3	4	5	6	7	very much
Environment 11:	not at all	1	2	3	4	5	6	7	very much
Environment 12:	not at all	1	2	3	4	5	6	7	very much
Environment 13:	not at all	1	2	3	4	5	6	7	very much

Environment 14:	not at all	1	2	3	4	5	6	7	very much
Environment 15:	not at all	1	2	3	4	5	6	7	very much
Environment 16:	not at all	1	2	3	4	5	6	7	very much
Environment 17:	not at all	1	2	3	4	5	6	7	very much
Environment 18:	not at all	1	2	3	4	5	6	7	very much
Environment 19:	not at all	1	2	3	4	5	6	7	very much
Environment 20:	not at all	1	2	3	4	5	6	7	very much

Please give us some information about yourself. This information will only be used to interpret the data and will remain strictly confidential and anonymous. Please circle the responses that apply.

Date:

ID code #:

Gender: Male Female

Age:
 less than 18 years old 18-22 years old 23-27 years old 28 and above

Major:
 Child and Family Studies Hotel Restaurant Administration Interior Design
 Nutrition Retail and Consumer Sciences

Standing (year): 1 2 3 4 5

How often do you go to upscale restaurants to eat (as a patron)?

For this study, a restaurant is considered upscale when its average dinner bill for one person is equal to or above \$12.00, not including tip. Please circle the answer that applies:

- | | |
|--|---|
| ☐ Every day | ☐ twice a month |
| ☐ 3 to 4 times a week | ☐ once a month |
| ☐ once a week | ☐ less than once a month |

How often do you go to upscale restaurants to work (as an employee)?

For this study, a restaurant is considered upscale when its average dinner bill for one person is equal to or above \$12.00, not including tip. Please circle the answer that applies:

- | | |
|--|---|
| ☐ Every day | ☐ twice a month |
| ☐ 3 to 4 times a week | ☐ once a month |
| ☐ once a week | ☐ less than once a month |

Phase I (Part 2)

QUESTIONNAIRE

This brief questionnaire¹ has been developed to discover what things are most important to you when you go to an upscale restaurant (upscale means that the average dinner bill for one person is equal to or above \$12.00, not including tip).

All that is required is that you read the instructions below, the definitions on page 2, and circle one of the words in each pair which appear on page 3. Remember there are no right or wrong answers. Rely on your initial reaction.

INSTRUCTIONS

On page 3 you will find 45 pairs of words. They represent all possible pairings of ten broad categories which are listed and briefly defined on page 2. After familiarizing yourself with the categories and what they represent, turn to page 3 and simply circle the word in each pairing that is most important to you. You may find some pairings more difficult than others, but please make a choice and circle it.

If you happen to forget the definitions of any of the categories, refresh your memory by re-reading the definitions on page 2.

Do not try to make this an intellectual task! You are not required to explain any selections you make. Try to think of the categories as not being related to one another in any way. In some cases it may help to ask yourself if you had to do without one of the items, which would you keep?

It is very important that you realize there are no "right" or "wrong" answers.

Base your selections on your feelings.

¹ De Long, A. J. (1971). A Contrastive Cultural Analysis Questionnaire

Definitions:

Sensory Stimulation: refers to an environment which is pleasing to the senses and contributes to a sense of joy or inspiration.

Coherence: the space is clearly organized, makes sense, and everything is where it belongs. It looks like it would be easy for you to find your way around.

Comfort: refers to the light and noise levels you feel are appropriate in an environment. The seats are comfortable, and you have plenty of elbow and leg room. You would not mind being there for a certain period of time.

Complexity: refers to the variety of things and textures that you can look at from your present vantage point. There are enough things in the environment to keep you interested for a while. You feel like the environment is challenging and stimulating.

Formality: refers to a sense of ceremony, order. You expect certain materials to be there, everything is planned and should operate smoothly. The environment makes you feel like you would need to wear evening dress to go there.

Nature: the space has natural elements such as water, plants or natural light sources.

Novelty: the environment feels unique, original, and out of the ordinary.

Mystery: the environment appears intriguing and makes you feel like traveling deeper into it to explore it. You feel like you could encounter something new if you could move about and change your vantage point.

Privacy: refers to the features that are available in the environment to allow you to feel that you are isolated from others due to the lighting level or other visual or physical barriers.

Spaciousness: refers to the feeling that there is room to wander around, there are places to go, or the environment feels open.

1. Sensory Stimulation Coherence	16. Coherence Privacy	31. Formality Nature
2. Sensory Stimulation Comfort	17. Coherence Spaciousness	32. Formality Novelty
3. Sensory Stimulation Complexity	18. Comfort Complexity	33. Formality Mystery
4. Sensory Stimulation Formality	19. Comfort Formality	34. Formality Privacy
5. Sensory Stimulation Nature	20. Comfort Nature	35. Formality Spaciousness
6. Sensory Stimulation Novelty	21. Comfort Novelty	36. Nature Novelty
7. Sensory Stimulation Mystery	22. Comfort Mystery	37. Nature Mystery
8. Sensory Stimulation Privacy	23. Comfort Privacy	38. Nature Privacy
9. Sensory Stimulation Spaciousness	24. Comfort Spaciousness	39. Nature Spaciousness
10. Coherence Comfort	25. Complexity Formality	40. Novelty Mystery
11. Coherence Complexity	26. Complexity Nature	41. Novelty Privacy
12. Coherence Formality	27. Complexity Novelty	42. Novelty Spaciousness
13. Coherence Nature	28. Complexity Mystery	43. Mystery Privacy
14. Coherence Novelty	29. Complexity Privacy	44. Mystery Spaciousness
15. Coherence Mystery	30. Complexity Spaciousness	45. Privacy Spaciousness

Appendix B

Questionnaire for Phase II

Phase II

Before you begin, please give us some information about yourself. This information will only be used to interpret the data and will remain strictly confidential and anonymous. Please circle the responses that apply.

Date:

Did you participate in phase I? Yes No

ID code #: (Write down the last 6 digits of your social security number):

- - - - -

Major:

☐ Child and Family Studies ☐ Hotel-Restaurant Administration ☐ Interior Design
☐ Nutrition ☐ Recreation ☐ Retail and Consumer Sciences
☐ Other _____

Instructions

Phase II will last approximately 30 minutes. You will be presented with a series of interior environments representing upscale restaurants (for this study, a restaurant is considered upscale if the average dinner bill is equal to or above \$12.00, tip excluded).

For each environment, you will evaluate the extent to which each visual attribute is present, by circling a number on a scale ranging from 1 to 7, with "1" meaning "this visual attribute is not present at all in this environment" and "7" meaning "this visual attribute is very much present in this environment". Number 4 on this scale represents an average score meaning that the attribute is present in a moderate way. The visual attributes that you will be evaluating for each slides are: *sensory stimulation, coherence, comfort, complexity, formality, nature, novelty, mystery, privacy, and spaciousness*.

All the attributes will be defined, so please take some time to read the definitions to make sure that you are evaluating the environments according to the same criteria as other participants. If at any time you happen to forget the definition of any of the attributes, do not hesitate to refresh your memory by rereading it.

There is no right or wrong answer, it is your opinion that is important. First, to familiarize you with the rating procedure, five practice slides of office environments will be presented to you. Please feel free to ask questions if you do not understand the procedure. Also, please keep in mind that your participation in this study is very much appreciated.

Practice: Environment 1

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

Practice: Environment 2

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

Practice: Environment 3

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

Practice: Environment 4

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

Practice: Environment 5

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

Restaurant Environment 1

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

Restaurant Environment 2

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

. . . **Restaurant Environment 19**

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

Restaurant Environment 20

Sensory Stimulation

not at all present 1 2 3 4 5 6 7 very much present

Coherence

not at all present 1 2 3 4 5 6 7 very much present

Comfort

not at all present 1 2 3 4 5 6 7 very much present

Complexity

not at all present 1 2 3 4 5 6 7 very much present

Formality

not at all present 1 2 3 4 5 6 7 very much present

Nature

not at all present 1 2 3 4 5 6 7 very much present

Novelty

not at all present 1 2 3 4 5 6 7 very much present

Mystery

not at all present 1 2 3 4 5 6 7 very much present

Privacy

not at all present 1 2 3 4 5 6 7 very much present

Spaciousness

not at all present 1 2 3 4 5 6 7 very much present

VITA

Valérie Andriani was born in Corté, Haute-Corse, France on August 19, 1970. She received her elementary and junior high education in Corté schools. She graduated with honors from high school from the Lycée Pascal Paoli in Corté, France, with a "Baccalauréat D" in sciences. She left Corsica and came to the United States to go to college. She majored in Studio Art and Spanish at the University of Virginia in Charlottesville and received her Bachelor of Arts degree in 1992. She went to Marymount University in Arlington, Virginia, to do her background work in design. She entered the Master's program in Interior Design at the University of Tennessee in Knoxville in August 1993 and officially received her Master's Degree from the University of Tennessee in August 1995. While attending the University of Tennessee, Valérie was a graduate teaching assistant in the Department of Interior Design for two years. She is a member of the Kappa Omicron Nu Home Economics Honor Society.