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Effects of Store Atmosphere on Shopping Behavior

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EFFECTS OF STORE ATMOSPHERE

ON SHOPPING BEHAVIOR

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CONTENTS

INTRODUCTION

It has long been recognized that consumers respond to more than just the core product or service being offered when making purchase decisions; they respond to the total product. One of the most important features of the total product can be the place where it is bought or consumed. In some instances, the place, or to be more specific, the atmosphere of the place, is more influential than the product itself in the purchase decision (Kotler 1973). Although today there is an increasing emphasis on store design, interior design, and overall environmental programming by retail merchandisers, many retailers still tend to underestimate the potential of using atmosphere as a marketing tool (Markin, Lillis, and Narayana 1976). In many cases, merchandisers are still more concerned with the tangible product, focusing their interest on practical and functional dimensions, while neglecting the aesthetic factor in purchase behavior.

Interior designers, architects, and landscapers, however, have acknowledged the extensive influence of the environment on behavior for years. Recently, psychologists have studied environment-behavior relationships, resulting in the swiftly growing psychological discipline known as "environmental psychology" (Donovan and Rossiter 1982). This discipline attempts to predict the collective effect of stimuli in a particular environment upon different peoples' feelings and

behavior (Mehrabian 1976). Thus, the main concerns in environmental psychology may be summarized as "(1) the direct impact of physical stimuli on human emotions and (2) the effect of the physical stimuli on a variety of behaviors, such as work performance or social interaction" (Mehrabian and Russell 1974, p. 4).

Until recently, environmental psychology has rarely been applied to the retail store environment. Previous studies have, however, suggested using atmospherics as an important part of the overall merchandising strategy (Kotler 1973; Markin, et al. 1976). Kotler defines atmospherics as "the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability" (p. 50). Markin, Lillis, and Narayana acknowledge that space affects customer behavior and that design and atmosphere may be used to shape and modify the behavior of shoppers.

However, these studies generally consider the atmosphere to be a component of store "image." Therefore, atmosphere is viewed simply as being one factor influencing store patronage decisions. For instance, Kotler 1973 suggests using atmospherics as a competitive tool in an attempt to attract and maintain a specific target market, especially where product and/or price differences are nominal. Also, Markin, et al., propose that,

> Via design features, attitudes and images
> are created; that is, store personalities

> are created and shaped, and these
> personalities - friendly, upper-class,
> aloof, high quality, low priced,
> convenient, warm, inviting, cool,
> haughty, etc. - are in turn meant to
> affect customer attitudes and images and
> hence to shape behavior . . . these
> attitudes and images affect questions of
> store choice and store loyalty (p. 51).

There is little sound documentation for the actual effects of store atmosphere on shopping behavior. Some retailers have claimed that they have influenced customers' buying behavior by manipulating store atmosphere via layout, color, lighting, and music (Wysocki 1979; Stevens 1980). However, this evidence is solely anecdotal. Researchers have been unable to document strong effects of store atmosphere for a variety of reasons. First, the effects evoked by store atmosphere are primarily emotional states that are difficult to verbalize. These emotions are temporary and therefore difficult to recall accurately. In addition, they influence behaviors within the store rather than more easily identifiable behaviors such as selecting which store to patronize (Donovan and Rossiter 1982). Previous retail image studies have used structured questionnaire surveys which ask respondents to rate various researcher-specified attributes according to their importance for patronage. However, this method clearly does not capture the consumer's true emotional responses to the store's atmosphere; it simply lists atmosphere as one component of store image.

In addition, the majority of previous store-atmosphere

measurement, which was usually done in the context of store image research, has been conducted outside of the store environment, long after the actual shopping experience. This method is not very reliable, since it is difficult for respondents to recall accurately their emotional responses to a particular atmosphere while in a different setting.

Thus, if store atmosphere can actually affect shopping behavior within the store, it is necessary to develop a framework with which to study such effects. This study will attempt to apply the Mehrabian-Russell model, an environmental psychology framework, to explore environmental variables in retail settings.

THE MEHRABIAN-RUSSELL MODEL

Environmental psychology focuses on two major topics: (1) the emotional impact of physical stimuli and (2) the effect of physical stimuli on a variety of behaviors (Mehrabian and Russell 1974). Thus, this discipline would appear to have valuable applications to store environments. The theoretical model developed in work by environmental psychologists Mehrabian and Russell 1974; Mehrabian 1980; and Russell and Pratt 1980, appears to be particularly valuable in studying the effects of store atmosphere on shopping behavior. As defined by Mehrabian and Russell, the approach "centers on the use of human emotional responses to

environments as intervening variables linking the environment
to the variety of behaviors it elicits" (p. xi). The purpose
of this paper is to adapt the Mehrabian-Russell model to the
retail setting and to test predictions from this model.

Figure 1

The Mehrabian-Russell Model

Environmental   Emotional   Behavioral
Stimuli   States   Responses
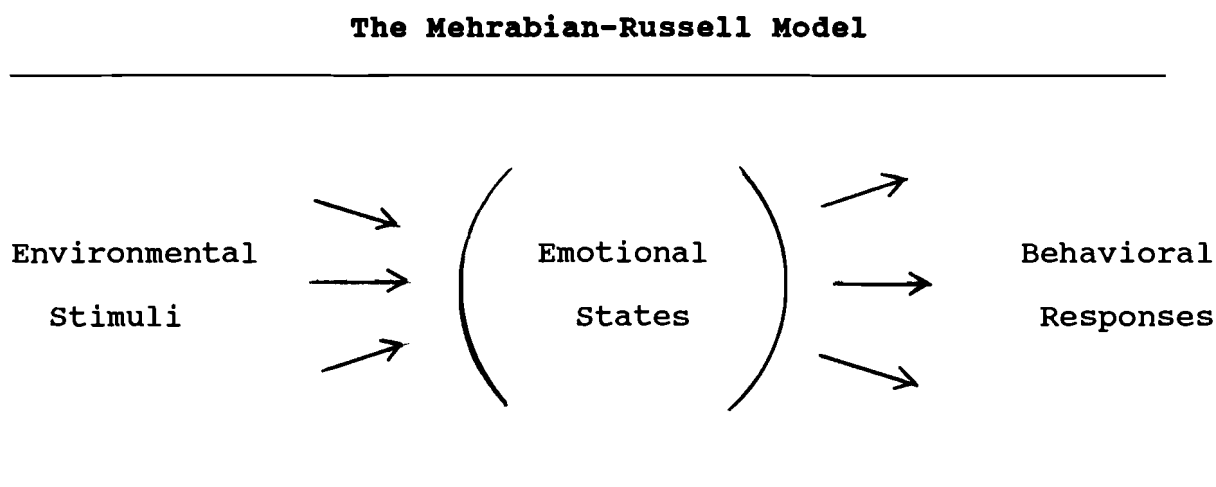
The Mehrabian-Russell approach uses a Stimulus-Organism-
Response model (See Figure 1). Thus, it requires a stimulus
taxonomy, a set of intervening variables, and a taxonomy of
responses. There should be a clear relationship between the
stimuli and responses by way of the intervening variables.

Environmental psychologists assume that individuals'
feelings and emotions ultimately determine their behavior.
They also assume that environments can evoke various feelings
which cause certain behaviors. Mehrabian (1976) states that

"human emotions are amenable to precise description, quantitative measurement, and statistical analysis. Environmental psychologists working under this assumption have provided a sound descriptive framework for emotions . . . (which) forms one of the crucial elements of the system that has been developed in order to evaluate whole environments and people's reactions to them" (p.9). This framework suggests that a particular environment causes certain emotional responses in an individual, which, in turn, cause the individual to approach or avoid the environment to a greater or lesser degree (Mehrabian 1976).

The Mehrabian-Russell model clearly defines the mediating variables and the response taxonomy. However, the selection of useful environmental descriptors, or stimulus variables, is very difficult. Previous environmental studies use a number of alternative sets of stimulus categories (Craik 1970; Ittelson, Rivlin, and Proshansky 1970). The most common procedure is to describe an environment in terms of various objects in it and the relations among these objects. For example, a park may be described as a lake with trees, flowers, and picnic tables around it. However, this list of descriptors could continue forever; therefore, one list does not form a complete description of the setting. In addition, the items are too vaguely defined. Thus, it is impossible to analyze behavioral changes resulting from changes in environments described in this fashion (Mehrabian and Russell

1974).

Another possible set of environment descriptors is the emotional reactions to variables which stimulate the senses, such as those for color, sound, temperature, and texture (Crane and Levy 1962; Schaie 1961; Bedford 1961; Middleton, Fay, Kerr, and Amft 1944). However, this list of descriptors is also quite long and awkward since most environments simultaneously include stimulation in all the sense modes, as well as along numerous stimulus dimensions within each modality (for instance, a color may be a certain hue and of a certain brightness). These descriptors also vary in time - a park may be bright and sunny one moment and cloudy the next.

To account for the overall effect of the various stimuli in a given environment, Mehrabian and Russell (1974) use information theory. They apply the concept of average information rate to characterize complex spatial and temporal arrangements of stimuli within and across settings. This concept will be more fully discussed later. First, the task of establishing the validity of the link between the set of mediating variables and the response taxonomy will be addressed.

Response Taxonomy

Mehrabian and Russell propose that individuals' reactions to all environments may be categorized as either approach or

avoidance behaviors, which include four basic dimensions: (1) a desire to remain physically (approach) or to leave (avoid) the environment; (2) a desire to explore (approach) the environment as opposed to a tendency to remain inanimate in (avoid) the environment; (3) a desire to communicate with (approach) others in the environment versus a tendency to avoid interacting with others; (4) enhancement (approach) of performance and satisfaction of task performances or hindrance (avoidance) of task performances. Donovan and Rossiter (1982) propose that these aspects may easily be applied to shopping behaviors in a retail environment, as shown in Figure 2.

Figure 2

Approach and Avoidance Responses

in a Retail Environment

Behavioral Dimension	Approach Behavior	Avoidance Behavior
Physical	Patronize store	Avoid store
Exploratory	Browse through merchandise	Look at minimum number of items
Communication	Interact with sales personnel	Avoid inter- action with personnel
Performance & Satisfaction	Repeat shopping in store frequently	Do not return to store

Intervening Variables

An adequate model requires intervening variables that are basic, immediate, and measurable reactions to all types of environmental stimulation. In addition, these variables must relate directly to the stimulus variables and also account for variations in other behaviors of concern (Mehrabian and Russell 1974). Mehrabian and Russell assert that three basic emotional states act as mediating variables between environmental stimuli and approach-avoidance behaviors: pleasure-displeasure, arousal-disarousal, and dominance-submissiveness. Each dimension is independent of the other two. The model proposes that every emotional state in an individual may be described as a combination of these three dimensions. Pleasure-displeasure refers to the degree to which an individual feels happy, joyful, contented, or satisfied. Arousal-nonarousal refers to one's level of activity, excitement, stimulation, or alertness. Dominance-submissiveness refers to the extent to which one feels unrestricted and in control of the situation.

Mehrabian and Russell present ample supporting evidence for the selection of three emotional states as the three intervening variables. They state that in order to understand individuals' interactions with various environments, it is essential to identify those responses that are the immediate result of stimulation and that occur in varying degrees in all

environments. Environmental psychology requires an exact description of such responses. Standard perceptual responses do not yield a complete list since it is necessary to consider numerous dimensions of response within each sense modality. Thus, in an attempt to identify responses common to all types of stimuli, regardless of the sense modality stimulated, Mehrabian and Russell turn to the study of intermodality. Results of intermodality studies show that emotional reactions represent the common core of human response to all types of environments (Mehrabian and Russell 1974).

Mehrabian and Russell propose that pleasure, arousal, and dominance are the three basic emotional reactions to all environments. They point to physiological studies that have demonstrated that there is a well-defined physiological mechanism associated with the experience of pleasure-pain. Electrical stimulation of areas of the hypothalamus and certain midbrain nuclei causes a pleasant sensation, and stimulation of lower parts of the midline system causes pain (Heath 1954; 1963; 1964a; 1964b; Olds 1956). This mechanism is common to all the sensory modalities. Furthermore, although the exact nature of the physiological arousal response is unknown, support is given to the notion of basic cross-modality responding (Lacey 1967). Thus, the physiological mechanisms support the idea that pleasure and arousal are two dimensions which cut across sense modality distinctions. Therefore, they are responses common to all

types of stimuli.

Further support is given by semantic differential studies (Osgood, Suci, and Tannenbaum 1957). These studies have shown that human judgments of complex samples of stimuli can be characterized in terms of three dimensions: evaluation, activity, and potency. The judgmental response of evaluation corresponds to the emotional response of pleasure; activity corresponds to arousal; and potency corresponds to an emotional reaction of dominance. Thus, according to Mehrabian and Russell, pleasure, arousal, and dominance constitute the common core of human emotional responses to all environmental stimuli.

However, Russell and Pratt 1980 suggest that the dominance dimension should be deleted from the Mehrabian-Russell model. Russell argues in his later work that since dominance requires a knowledgeable interpretation by the individual, it is not purely applicable in situations calling for emotional responses. Russell and Pratt (1980) claim that the two dimensions of pleasure and arousal are sufficient to represent individuals' affective responses to all types of situations. They point out that evidence for the suitability of the dominance dimension, on the other hand, is quite tenuous. Nonetheless, in this study, I will retain Mehrabian and Russell's original tridimensional model and test to find out if, in fact, the dominance dimension is significant or insignificant.

Although the three basic emotional states are orthogonal (that is, none causes the other and they are completely independent), the Mehrabian-Russell model does hypothesize that there is a conditional interaction between pleasure and arousal in determining approach-avoidance behaviors. In a neutral environment (i.e., one that is neither pleasing nor displeasing), mild arousal tends to enhance approach behaviors, while extremely high or extremely low arousal tends to cause avoidance behaviors. In a pleasant environment, the higher the level of arousal, the greater the approach behavior; in an unpleasant environment, the greater the arousal, the greater the avoidance behavior. Thus, Mehrabian and Russell argue that these emotional dimensions do interact under these conditions, as shown in Figure 3 on the following page.

Stimulus Taxonomy

As previously noted, the selection of appropriate stimulus factors is extremely difficult because of the complex and changing combinations of stimuli encountered in any environmental setting. Future research must be conducted using in-store experimentation to learn which particular types of in-store stimulus variables (such as store layouts, color arrangements, lighting, noise levels, and in-store promotions) cause which types of emotional responses, thereby resulting in approach or avoidance behaviors (Donovan and Rossiter

Figure 3

COMBINED EFFECTS OF PLEASURE AND AROUSAL

ON APPROACH-AVOIDANCE BEHAVIOR
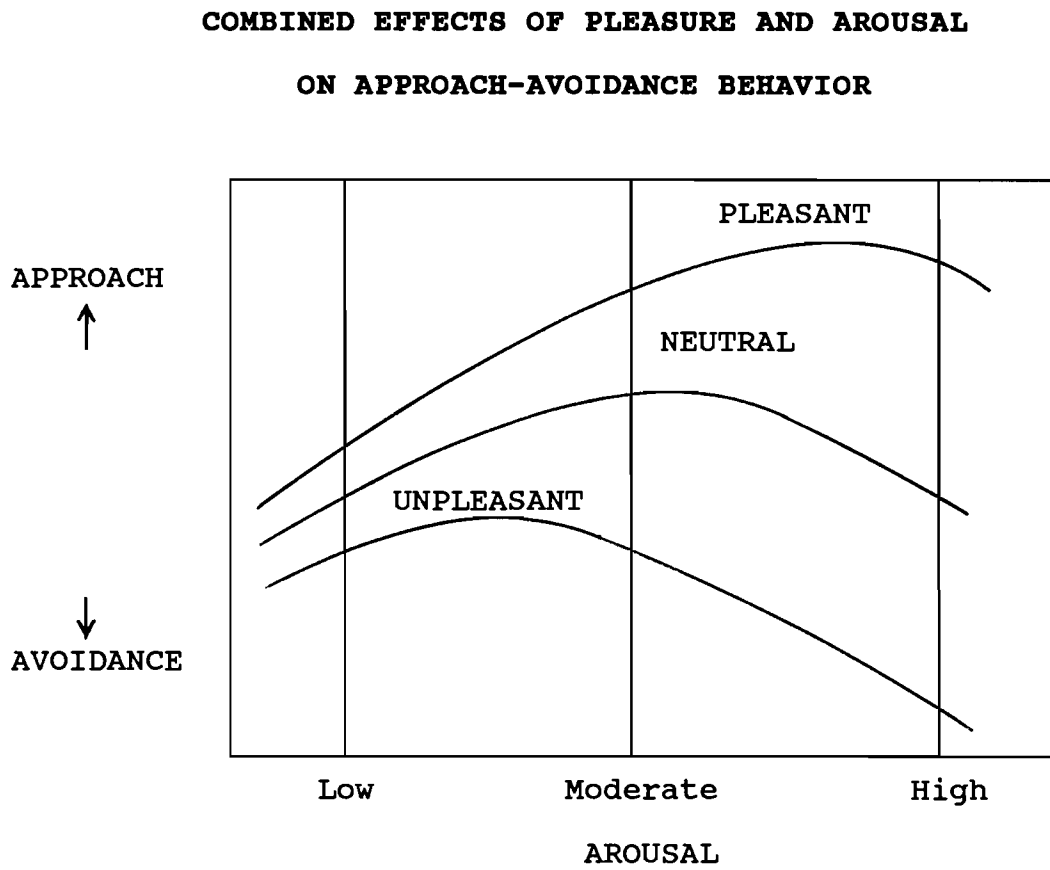
1982).

Environmental psychologists have, however, developed a general system to describe various environments. The core of this descriptive system is the concept of "information rate," or the amount of information contained or perceived in the environment per unit of time (Mehrabian 1976). This rate may be described as the "load" of an environment. The more information in the form of stimuli that an observer must process, the higher the load of the environment. Mehrabian and Russell (1974) refer to the load of any environment as a combination of its novelty and complexity. The novelty of an environment has to do with the degree of unfamiliarity and uncertainty. Complexity refers to the number of elements, features, or changes in an environmental setting. When the factors of novelty and complexity are summed, a reliable measure for any environment is obtained: its load.

Mehrabian and Russell assume that environmental load is a direct correlate of the emotional response of arousal. The higher the load, the higher a person's arousal level. Therefore, an environment that is unfamiliar, surprising, crowded, and complex will cause a person to become stimulated, excited, jittery, and alert. Conversely, an environment that is common, probable, usual, and expected will cause feelings of relaxation, calmness, and sluggishness.

However, a person's individual method of responding to external information must be taken into consideration when

measuring one's arousal response to the environmental load. Mehrabian (1976) suggests that one's degree of arousal may be related to the extent to which that person screens or filters incoming stimuli, referred to as "stimulus screening." "Screeners" respond only to selective stimuli. They unconsciously screen out less important aspects of the environment, thereby effectively reducing its load. "Nonscreeners," on the other hand, are less selective in what they respond to. They tend to sense more stimuli in all environments and are more sensitive to stimulus changes than are screeners. Therefore, nonscreeners experience settings as being more complex and more loaded, resulting in higher arousal levels. Stimulus screening can be used to draw implications for the environmental preferences of individuals. Since nonscreeners become more aroused in high-load environments, they exhibit more extreme approach-avoidance behaviors to pleasant and unpleasant settings: compared to screeners, they are more likely to approach high-load and pleasant places and to avoid high-load and unpleasant ones (Mehrabian 1976). Thus, Mehrabian and Russell's model specifies how individual differences are expected to relate to the other variables in their system.

Summary of the Mehrabian-Russell Model

An individual's reaction to any environment may be

categorized as either approach or avoidance behavior. Approach behaviors include physically moving toward, exploring, communicating, and performing in an environment, as well as returning to that environment. Avoidance behaviors include a desire to leave, disinterest, lack of interaction, and poor performance in an environment, as well as never returning to that environment. These behaviors are caused by an individual's emotional states evoked by the environment. Mehrabian and Russell's model posits that three basic emotional states - pleasure, arousal, and dominance - form the palette from which all feelings are created. Each emotional dimension is independent of the other two. However, pleasure and arousal are hypothesized to interact: the higher the arousal level, the greater the approach behavior in pleasant environments, and the greater the avoidance behavior in unpleasant settings.

The concept of information rate, or load, is used as the stimulus taxonomy of an environment that arouses the various emotional states. The degree of arousal caused by an environment may be directly correlated with the information load of the setting. An individual's characteristic way of responding to external stimulation also modifies his or her arousal response to the environmental load. A given load evokes less arousal in those who tend to screen out irrelevant stimulation than in those who are nonscreeners, and vice versa.

The complete Mehrabian-Russell model is summarized in Figure 4 on the following page. In applying the Mehrabian-Russell model to the retail setting, it may be predicted that customers will spend more time and perhaps make more purchases in those retail atmospheres which evoke feelings of pleasure and a moderate to high degree of arousal.

In this study, unlike previous studies, I will also compare and contrast the intended shopping behavior of college students with various educational backgrounds. Results may help predict whether majors have an effect on the degree of approach-avoidance behavior students exhibit in a retail setting. For example, does the fact that business majors are more knowledgeable of marketing tactics cause them to behave any differently in a retail store than individuals with other majors might? The answer to such questions may be of importance to retailers who wish to use atmospherics as a marketing tool when their products are aimed at distinct psychographic segments.

I will also compare and contrast the intended shopping behavior of males and females. Results may suggest that one gender is more highly affected by the store environment than the other. For example, it may be that retail atmospheres evoke stronger emotions in females that in males. This would suggest that females may exhibit more approach behavior in pleasant environments than would males. Therefore, it may be advantageous for stores to emphasize specific environmental

Figure 4

The Mehrabian-Russell Model

```
┌─────────────────────────┐
│ THE ENVIRONMENT         │
│                         │
│ Sense modality          │
│  variables              │
│  (e.g., color           │
│  and temperature)       │
│                         │         ┌─────────────────────┐
│ Information rate         │        │ BEHAVIORAL          │
│  (Characterizing        │        │ RESPONSES           │
│  the spatial            │ ┌──────┐│                     │
│  and temporal           │ │PRIMARY││ Approach-avoidance │
│  relationships          │ │EMOTIONAL│                   │
│  among the              │ │RESPONSES│ (which includes   │
│  stimulus components    │ │       ││ physical approach, │
│  of an environment)     │ │Pleasure│ exploration,      │
└─────────────────────────┘ │       ││ affiliation, per- │
                            │ Arousal│ formance, or other │
                            │       ││ verbal and non-    │
                            │Dominance│ verbal communica- │
                            └──────┘│ tions of           │
   ┌─────────────────┐              │ preference)        │
   │ Characteristic  │              └─────────────────────┘
   │ emotions asso-  │
   │ ciated with     │
   │ PERSONALITY     │
   └─────────────────┘
```

(Mehrabian and Russell 1974, p. 8)

variables in departments frequented by women to enhance approach behavior of female shoppers.

METHOD

Overview

The empirical portion of this study uses the Mehrabian-Russell model to establish a relationship between emotional states evoked in a retail environment and statements of behavioral intention in that environmental setting.

Sample

Fifty-five Illinois Wesleyan University students served as subjects, including 28 with business majors and 27 with social science majors. The sample included 35 males and 20 females. All subjects were between the ages of 19 and 22. Each person was randomly assigned to two retail environments in the Bloomington-Normal, Illinois area. The selected stores included Bergner's, J.C. Penney, Sears, Target, Von Maur, and Woolworths. To ensure various shopping times, respondents were instructed to visit each retail store on a different day and at a different time of day.

Procedure

Respondents entered each store and moved to a central

location within the store; in multilevel stores, this was on the first floor. Then, while in the store, they completed the questionnaire ratings (See Appendices A,B,C).

Measures

The questionnaire consisted of three sections. The first section evaluated subjects' emotional states while in the store environment, using Mehrabian and Russell's (1974) semantic differential measures of emotional state (See Appendix A). Several of the original dominance scales (in control-cared for, autonomous-guided, important-awed) were replaced by more context-appropriate items (restricted-free, crowded-overcrowded, important-insignificant) as suggested by Donovan and Rossiter 1982.

Mehrabian and Russell devised this self-report measure of the three emotional dimensions over the course of three separate studies. In the first study, based on intuitive grounds, they devised a tentative set of descriptors for the three emotional factors. They proceeded directly to construct scales that would most directly and uniquely measure pleasure, arousal, and dominance because, as noted earlier, their review of the applicable literature had shown that various combinations of these three factors may sufficiently represent the diverse emotional reactions to environments (Mehrabian and Russell 1974). Mehrabian and Russell also wrote forty verbally

described situations to provide a wide variety of physical environments which would elicit many diverse emotional states. One hundred thirty-four subjects were given a random selection of eight situations and asked to describe how they would feel in each one by using the twenty-eight adjective pairs (which were the descriptors for the three emotional dimensions).

The resulting correlation matrix was factor analyzed, yielding three factors with eigenvalues greater than one. These factors were labeled pleasure, arousal, and dominance; the six highest loading items in each factor were then viewed as adequate measures for that factor (Mehrabian and Russell 1974). A second study was performed to improve the emotional descriptors. Once again, there were three factors with eigenvalues exceeding one, measuring pleasure, arousal, and dominance.

A third study was executed to cross-validate the findings from the second study and determine the six best items for each emotional dimension. Thus, the semantic differential measures of emotional state used (but slightly modified) in this study (Appendix A) are based on the results from all three of Mehrabian and Russell's studies and include the six best descriptive adjective pairs for each of the three emotional factors. To compute factor scores for a respondent who rates his or her emotions in a store environment, his or her responses to items loading highest on each factor are simply added.

The second section of the questionnaire used in this study

contained Mehrabian and Russell's (1974) General Measure of Information Rate, which measured the environmental load factor (See Appendix B). The first step Mehrabian and Russell took in developing this measure of information rate was to devise a set of adjective pairs which may be used to characterize environments. Examples of these adjectives are simple-complex, patterned-random, familiar-novel, and sparse-dense. With the use of these adjective pairs, Mehrabian and Russell (1974) were attempting (1) to provide preliminary validation for their conceptualization of information rate, and, (2) to develop a more adequate verbal scale of information rate by eliminating those items in the original set that were related more to objective judgment than to emotions.

In their study, Mehrabian and Russell asked 214 undergraduates to read a set of six situations from those devised for the measures of emotional state study. Each subject then characterized his emotional reaction to each situation, after which he or she rated the same situation on the adjective pairs used to measure information rate. Thus, the researchers were interested in determining how emotional states and environmental descriptors were correlated in identical situations. The resulting matrix of intercorrelations among the items was factor analyzed, and a principal component solution was obtained. There were five factors with eigenvalues greater than one. These factors accounted for 60% of the total variance. Two of the factors appeared to be heavily biased by

evaluative judgments. Thus, to determine the extent of this bias, the respondent's emotional reactions of pleasure, arousal, and dominance to each situation were computed. Next, regression equations were written to express each adjective pair in terms of these emotional reactions.

By using the information rate-arousal hypothesis, this study validated Mehrabian and Russell's assertion that their set of adjective pairs formed measures of information rate. The coefficients in the regression equations showed that arousal was a significant component in all but two cases. In addition, the regression equations provided useful information for selecting a subset of the adjective pairs to be used as a verbal measure of information rate. The two factors that appeared to be evaluatively biased in the beginning were eliminated, because the regression equations showed that these two factors characterized aspects of environments that mainly affected pleasure rather than arousal.

Thus, the final scale in Appendix B includes the remaining fourteen adjective pairs which may be used to describe an environment's information rate. Total scores for this measure are computed by reversing the signs of subjects' responses to the negatively signed items (which are those adjective pairs in which the adjective referring to an environment of higher information rate, e.g., complex, random, novel, dense, was placed on the left) and then by using an algebraic sum over all items. Thus, the higher the sum, the higher the subject rated

the information load of the environment.

The third section of the questionnaire used in this study measured subjects' intentions of behavior in the store (See Appendix C). Questions originally devised by Mehrabian and Russell were modified by Donovan and Rossiter (1982) to fit retail shopping intentions.

Mehrabian and Russell conducted three experiments to test their hypothesis that preference, exploration, work performance, and affiliation are intercorrelated aspects of response to a situation and can all be subsumed under the generic concept of approach-avoidance (These four dimensions were described and illustrated earlier in Exhibit 2). These studies showed that all the behaviors that were assumed to be part of an approach-avoidance reaction to situations were indeed significantly intercorrelated. As a result, Mehrabian and Russell (1974) concluded that the following verbal attempts to measure approach (+) - avoidance (-) were accurate (p. 221):

Desire to Stay in the Situation

(+) 1. How much time would you like to
        spend in this situation?

(-) 2. How much would you try to leave
        or get out of this situation?

Desire to Explore the Situation

(+) 3. Once in this situation, how much
        would you enjoy exploring
        around?

(-) 4. How much would you try to avoid

any looking around or
exploration of this situation?
(0 = no avoidance)

Desire to Work in the Situation

(+) 5. To what extent is this situation
a good opportunity to think out
some difficult task you have
been working on?

(-) 6. How much would you dislike
having to work in this
situation? (0 = no dislike)

Desire to Affiliate in the Situation

(+) 7. To what extent is this a
situation in which you would
feel friendly and talkative to a
stranger who happens to be near
you?

(-) 8. Is this a situation in which you
might try to avoid other people,
avoid having to talk to them?
(0 = no avoidance)

In their study, Mehrabian and Russell presented the eight questions in this list in a random order, without the category name (e.g., "Desire to Stay in the Situation"). The respondent answered each question by circling one of the alternatives similar to those found in Appendix C. To compute scores on each of the four dimensions, first the numerical responses to the negatively signed items are assigned minus signs. Next, the scores for each pair are summed. The higher the resulting score, the greater the subject's approach

behavior.

In all three of Mehrabian and Russell's experiments, desire for affiliation was identified as a separate factor. In addition, there was evidence suggesting that desire to work should be treated as a separate dependent measure. Therefore, Mehrabian and Russell suggest that the four approach-avoidance factors be analyzed separately when detailed information is needed on how the particular environment influences each of these factors.

ANALYSIS AND RESULTS

The primary objective of this analysis is to determine the extent to which respondents' approach-avoidance responses may be predicted from their reported emotional states while in the various retail environments.

Factor Analysis Results

Separate factor analyses (principal components, varimax rotation of factors with eigenvalues greater than or equal to 1.0) were carried out on the 18 emotional measures, the 8 approach-avoidance responses, and the 14 information-rate items. Results of these respective factor analyses appear in Tables 1, 2, and 3. Reliability estimates (coefficient alpha) for the various factor-based indices appear in Table 4. The

coefficient alpha is based on the internal consistency of a test. Thus, it is based on the average correlation of item pairs within each factor. It ranges from 0 to 1. The higher alpha is, the more reliable the scale.

Pleasure-Arousal-Dominance. The three factors resulting from the 18 emotional measures are clearly identifiable as pleasure, arousal, and dominance (See Table 1 on the following page). Pleasure is by far the strongest factor. The relative insignificance of the dominance dimension is consistent with Russell's more recent findings (Russell and Pratt 1980). Overall, however, the pleasure, arousal, and dominance dimensions that were developed by Mehrabian and Russell in the laboratory situation retained their nature and factorial independence in actual retail environments.

For later analysis, I computed pleasure, arousal, and dominance scores for each subject by computing the average of the six highest loading items on factor 1, the five highest loading items on factor 2, and the three highest loading items on factor 3 (Table 1). These scores were then designated as a respondent's Pleasure, Arousal, and Dominance. Reliability coefficients (alpha) are high for all measures: Pleasure (.92), Arousal (.87), and Dominance (.72) (Table 4, page 33).

Table 1

Factor Analysis Results

for the 18 Pleasure-Arousal-Dominance Measures[1]

FACTOR LOADINGS[2]

MEASURE	Factor 1 (Pleasure)	Factor 2 (Arousal)	Factor 3 (Dominance)
Happy-Unhappy	.74164	.32290	---
Pleased-Annoyed	.86851	---	---
Satisfied-Unsatisfied	.87761	---	---
Contented-Depressed	.85958	---	---
Hopeful-Despairing	.72792	---	---
Relaxed-Bored	.67311	---	---
Important-Insignificant	.64739	---	.36020
Free-Restricted	.44487	---	---
Stimulated-Relaxed	---	.69880	---
Excited-Calm	---	.81573	---
Jittery-Dull	---	.75177	---
Interested-Disinterested	.75211	.41538	---
Frenzied-Sluggish	.32249	.70380	---
Overcrowded-Uncrowded	---	.34820	---
Wideawake-Sleepy	---	.77889	---
Controlling-Controlled	---	---	.81405
Dominant-Submissive	---	---	.84010
Influential-Influenced	---	---	.68499
Variance	39.4%	12.4%	10.0%

[1]Three factors with eigenvalues > 1.0 accounted for 61.7 percent of the variance.

[2]Loadings < .3 not shown.

Approach-Avoidance Responses. The factor analysis of the eight dependent measures originally yielded two factors with eigenvalues greater than 1.0, which is inconsistent with the findings of Mehrabian and Russell (1974). Mehrabian and Russell found that the affiliative responses in their scale

("friendly to strangers" and "avoid talking to people") were generally quite independent of the other approach-avoidance responses. However, in this study, one of these items loaded on factor 1, while the other loaded on factor 2. Thus, they were not independent of the other responses. In addition, the second factor in this study had an eigenvalue of only 1.05. Therefore, I am using a unidimensional scale to represent approach-avoidance responses (See Table 2 on the following page).

For later analysis, I computed an approach-avoidance score for each subject by computing the average of the five highest loading items on factor 1. The reliability coefficient for Approach-Avoidance (.91) is acceptably high (Table 4, page 33).

Information Rate. Theoretically, the information rate in an environment should be a unidimensional variable. However, Mehrabian and Russell (1974) found three dimensions among their 14 measures. They labeled these dimensions as "novelty" (common-rare, familiar-novel, ordinary-surprising); "complexity" (continuous-intermittent, homogeneous-heterogeneous, symmetrical-asymmetrical, similar-contrasting, patterned-random, redundant-varied); and "spaciousness" (small scale-large scale, simple-complex, sparse-dense, uncrowded-crowded, distant-immediate). Donovan and Rossiter (1982) found five factors with eigenvalues greater than 1.0, which they labeled "novelty," "variety," "irregularity," "density,"

Table 2

Factor Analysis Results for the Approach-Avoidance

(and Spending) Responses[1]

MEASURE	FACTOR LOADINGS Factor 1
Do you <u>like</u> the environment?	.90066
Would you <u>enjoy</u> shopping in this store?	.92711
Would you avoid <u>returning</u>? (reverse scoring)	.81671
Would you feel <u>friendly</u> to a stranger?	.38294
Would you avoid other <u>people</u>? (reverse scoring)	.55997
Would you <u>spend</u> more than you set out to?	.68744
How much <u>time</u> would you spend browsing?	.82860
Would you avoid <u>exploring</u>? (reverse scoring)	.86822
Variance	58.9%

[1]Factor 1 accounted for 58.9 percent of the variance.

and "size." The present study also yielded five factors with eigenvalues greater than 1.0. However, since the fifth factor had a eigenvalue of only 1.00033 and represented no distinguishable dimension of information rate, I forced my factor analysis down to four factors. The four factors are labeled identically to those of Donovan and Rossiter with the omission of the "size" factor (See Table 3 on the following page).

For later analysis, I defined four information-rate measures: novelty (average of novel-familiar, ordinary-surprising, common-rare); variety (average of simple-complex, similar-contrasting, homogeneous-heterogeneous); density (average of sparse-dense, intermittent-continuous, immediate-distant) and irregularity (average of uncrowded-crowded, symmetrical-asymmetrical, patterned-random). The reliability coefficient for novelty (.88) is acceptably high. The unreliability of the variety (.63), density (-.12), and irregularity (.38) measures, however, means that their relationships with other variables should be regarded as tentative (Table 4, page 33).

Table 3

Factor Analysis Results for the Information-Rate Measures[1]

FACTOR LOADINGS[2]

MEASURE	Factor 1 (Novelty)	Factor 2 (Variety)	Factor 3 (Density)	Factor 4 (Irreg.)
Usual-Surprising	.85649	---	---	---
Common-Rare	.89695	---	---	---
Familiar-Novel	.84178	---	---	---
Redundant-Varied	.44341	.50302	---	---
Similar-Contrasting	.39069	.71123	---	---
Simple-Complex	.38088	.65508	---	---
Homogeneous-Heterogeneous	---	.71026	---	---
Sparse-Dense	---	---	.65427	---
Continuous-Intermittent	---	.43682	-.69958	---
Distant-Immediate	---	---	.69745	---
Small scale-Large scale	.31828	---	.44366	---
Patterned-Random	---	---	---	.75508
Uncrowded-Crowded	---	---	---	.54596
Symmetrical-Asymmetrical	---	---	---	.54812
Variance	25.7%	13.9%	11.6%	9.3%

[1]Four factors with eigenvalues > 1.0 accounted for 60.4 percent of the variance.

[2]Loadings < .3 not shown.

Table 4

Reliability Estimates (Coefficient Alpha)
for Index Measures

Dependent Measure		Information-rate Measures		Pleasure-Arousal-Dominance Measures	
Approach-Avoidance	.91	Novelty	.88	Pleasure	.92
		Variety	.63	Arousal	.87
		Density	-.12	Dominance	.72
		Irregularity	.38		

Regression Analysis Results

Once the large set of candidate measures for Pleasure-Arousal-Dominance and Approach-Avoidance had been reduced to single scores for each dimension for each respondent, the following model was tested using multiple regression analysis: $AA = B_1(P) + B_2(A) + B_3(D) + B_4(Sex) + B_5(Major) + E$, where AA is Approach-Avoidance behavior, P is Pleasure, A is Arousal, D is Dominance, Sex is the respondent's Sex, Major is the respondent's academic Major, and E is a random error term. Since the model deals with nonstandard units of measure (what is an increase of one unit of pleasure?), beta coefficients are used. Therefore, the constant drops out of the equation.

Pleasure-Arousal-Dominance and Approach-Avoidance.

Table 5 (on the following page) shows the regression of the independent variables, including the pleasure, arousal, and dominance dimensions and the respondent's major and sex,

against the dependent variable, approach and avoidance behavior. In agreement with Mehrabian and Russell's findings, pleasure is clearly the major predictor of behavior. In this study, the respondent's sex is also a significant predictor. The subject's academic background or major, however, does not appear to have any affect on shopping behavior intentions. Likewise, dominance and arousal are insignificant predictors of behavior. The failure of the dominance dimension to predict approach-avoidance intentions is consistent with the later findings of Russell.

Thus, the sex of the subject and the perceived pleasantness of the within-store environment are the major predictors in the equation, with the equation itself accounting for a substantial 65 percent of the variation in intended approach-avoidance behaviors in the retail stores.

Table 5

Beta Coefficients for the Dimensions Used to Predict the Approach-Avoidance Behavior

Dimension	Estimated Coefficients	T Statistics
Pleasure	.77230	11.187[a]
Arousal	.08740	1.259
Dominance	-.02977	-.514
Sex	.23203	3.442[a]
Major	-.00695	-.103
Multiple R	.81803	
R^2 (adjusted)	.65326	

[a]Significant at an alpha of .05.

These results suggest that arousal is not significantly related to approach-avoidance behavior. However, as stated earlier, Mehrabian and Russell hypothesized that there is a conditional interaction between pleasure and avoidance. They proposed that in a pleasant environment, the higher the level of arousal, the greater the approach behavior; in an unpleasant environment, the greater the arousal, the greater the avoidance behavior. Donovan and Rossiter's study in 1982 provided support for this pleasure-arousal interaction hypothesis. This study, however, does not provide support. I tested Mehrabian and Russell's hypothesis by computing two regressions: one for pleasant environments (pleasure scores above zero) and another for unpleasant environments (pleasure scores below zero). According to the hypothesis, arousal should have a high, positive coefficient (and therefore emerge as a significant predictor of approach intentions) in pleasant retail environments, and a negative coefficient in unpleasant environments. In this study, arousal is insignificant in both cases. Thus, arousal may not be used to predict approach-avoidance behavior of the respondents in the present sample.

Of particular interest in this study is the finding that sex is a significant predictor of shopping behavior. To determine which sex's approach-avoidance behaviors are most affected by store environment, I created two interaction variables: one for an interaction between sex and pleasure and another for an interaction between sex and arousal. I

then used multiple regression analysis to test the following model: $AA = B_1(Sex) + B_2(P) + B^3(A) + B_4(P * Sex) + B_5(A * Sex) + E$. Thus, I computed a regression of the pleasure, arousal, sex, and two interaction variables against the dependent variable, behavior. Since the interaction variable between sex and arousal was insignificant, I computed a second regression without this variable, resulting in a better equation with a higher adjusted R square (Table 6).

Table 6

Beta Coefficients for the Pleasure, Arousal, Sex, and Sex-Pleasure Interaction Dimensions Used to Predict the Approach-Avoidance Behavior

Dimension	Estimated Coefficients	T Statistics
Pleasure	.96815	9.585[a]
Arousal	.10333	1.538
Sex	.31450	4.937[a]
Sex-Pleasure Interaction	-.25596	-2.625[a]
Multiple R	.82987	
R^2 (adjusted)	.67683	

[a]Significant at an alpha of .05.

The effect of the pleasure evoked by the retail environment on male and female shopping behavior is shown in Figure 5 (on the following page). Surprisingly, male college students

appear to be more sensitive than female students to the environment in a retail store. As the pleasure evoked by the store environment increases, the rate of approach-avoidance behavior of the males increases at a faster rate than does that of the females. This finding may present interesting implications to retailers. Perhaps they should place more emphasis on certain environmental variables in the departments frequented by men to evoke a more pleasurable feeling, resulting in an increase in approach behavior by the male shoppers.

Figure 5

Effect of Pleasure Evoked by the Retail Environment
on the Approach-Avoidance Behavior of Males and Females
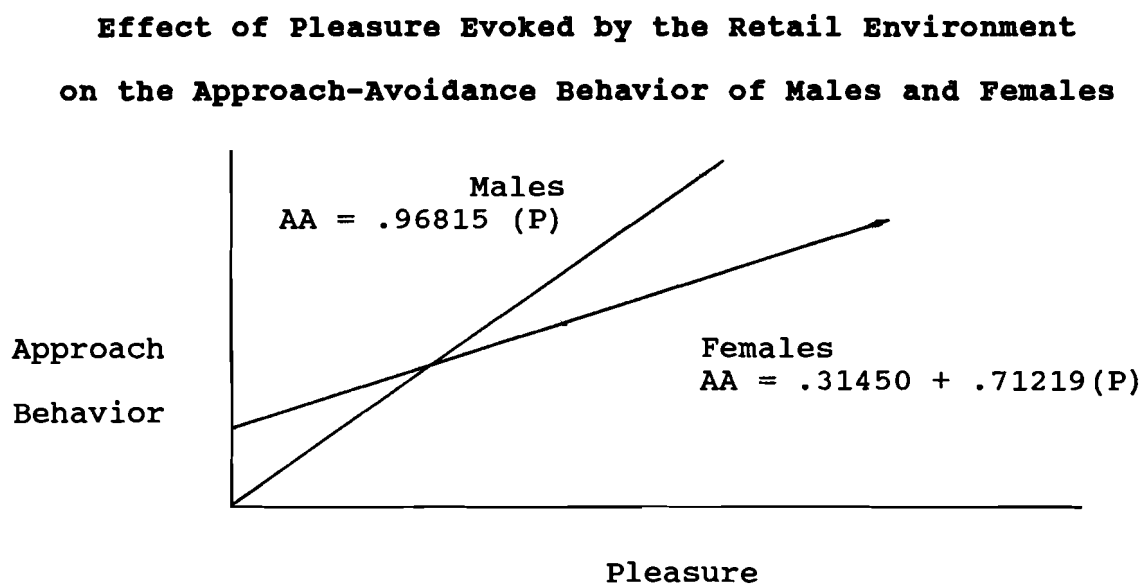
In sum, the pleasure-arousal-dominance emotional states do correlate with approach-avoidance intentions in retail stores, since the R^2 for the original regression was .65326.

The relationship is strongest for pleasure. However, arousal is not a particularly significant predictor of approach-avoidance behavior, nor is dominance, as suggested in Russell's more recent studies.

In addition, this study found the sex of the respondent to be a major predictor of shopping behavior intentions.

Information Rate, Pleasure-Arousal-Dominance, and Approach-Avoidance. Table 7 (on the following page) shows the regression of the dependent approach-avoidance behavior on the pleasure-arousal-dominance dimensions (and sex and major) with the addition of the information-rate measures. The multiple R and adjusted R^2 are increased only slightly from the original regression which did not contain the information-rate measures.

Thus, this study, like that of Donovan and Rossiter (1982) suggests that the information rate is not particularly useful in helping to predict approach-avoidance behavior. According to the Mehrabian-Russell model, arousal is a direct response to the information rate in the environment. However, in this study, perceived information rate is not an accurate predictor of an individual's level of arousal. Table 8 (on the following page) shows an adjusted R^2 of only .19862 for the regression of the information-rate measures on arousal. Only one information-rate measure (novelty) increases arousal, while the others (variety, density, and irregularity) have no significant relationship with arousal. However, as noted

Table 7

Beta Coefficients for Pleasure-Arousal-Dominance, Sex, Major, and Information-Rate Dimensions Used to Predict Approach-Avoidance Behavior

Dimension	Estimated Coefficients	T Statistics
Pleasure	.67228	7.3100[a]
Arousal	.04180	.5800
Dominance	.00893	.1460
Novelty	.01883	.2290
Variety	.04834	.7260
Irregularity	.00021	.0030
Density	.01148	.1830
Sex	.21263	3.5920[a]
Major	.00021	.0041
Multiple R	.83114	
R^2 (adjusted)	.66297	

[a]Significant at an alpha of .05.

Table 8

Beta Coefficients for Information-Rate Dimensions Used to Predict the Arousal Dimension

Information-Rate Dimension	Estimated Coefficients	T Statistics
Novelty	.44851	4.6100[a]
Variety	.07748	.7870
Density	.03601	.3810
Irregularity	.01046	.1190
Multiple R	.47752	
R^2 (adjusted)	.19862	

[a]Significant at an alpha of .05.

earlier, all of the information-rate measures but <u>novelty</u> are of questionable reliability. This fact may have reduced their predictive potential. Thus, though arousal may be to some extent a function of the information-rate in the environment, it is not a direct response to the information rate as was implied by the Mehrabian-Russell model.

Perceived information rate is helpful in predicting an individual's level of pleasure, however. The regression of the information-rate measures on pleasure in Table 9 shows that both the <u>novelty</u> and <u>irregularity</u> of an environment are significant predictors of one's level of pleasure. The results suggest that a novel environment (one that is surprising, rare, varied, contrasting, and complex) would increase pleasure, while an irregular atmosphere (one that is random, crowded, and asymmetrical) would appear to decrease pleasure.

Table 9

Beta Coefficients for Information-Rate Dimensions

Used to Predict the Pleasure Dimension

Information-Rate Dimension	Estimated Coefficients	T Statistics
Novelty	.63053	7.7830[a]
Variety	.07742	.9450
Density	.11717	1.4910
Irregularity	-.27633	-3.7680[a]
Multiple R	.68167	
R^2 (adjusted)	.44427	

[a]Significant at an alpha of .05.

CONCLUSIONS, MANAGERIAL IMPLICATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

Overall, this study suggests that the Mehrabian-Russell model is useful for studying approach-avoidance behaviors within retail environments. However, the study is just a starting point since it was strictly correlational rather than experimental, and it tested the model only with stated behavioral intentions rather than with actual behaviors. These points should be kept in mind while analyzing the following implications.

This study implies that store-induced pleasure, the first variable in the Mehrabian-Russell model, is an extremely powerful determinant of approach-avoidance behaviors within the store. If an environment is perceived as pleasurable, and hence rewarding, it seems logical that the activities which transpire in that environment would also be pleasurable and rewarding. Thus, consumers would tend to exhibit more approach behavior in pleasing environments. They would browse through the merchandise, interact with the sales personnel, and perhaps spend more money than they had planned.

In contrast to the Mehrabian-Russell model and the work of Donovan and Rossiter (1982), results of this study suggest that arousal is not a particularly significant predictor of approach-avoidance behaviors. It is possible that a few of the students in my sample did not fully understand the

meanings or the applicability of some of the terms used in the questionnaire to rate this measure.

Dominance, the third emotional measure in the model, also appears to be unrelated to in-store behaviors. This finding correlates with that of Russell and Pratt (1980), which stated that since dominance requires a knowledgeable interpretation by the individual, it is not purely applicable in situations calling for emotional responses.

An interesting finding of this study is the significance of one's sex in predicting approach-avoidance behavior within a retail environment. Results suggest an interaction between sex and pleasure, in which male college students are more affected by higher levels of store-induced pleasure than are female students. Thus, it may by predicted that male consumers would exhibit more approach behavior in a pleasing environment than would female consumers.

In summary, the pleasure-arousal-dominance (especially the pleasure) part of the Mehrabian-Russell model, with the addition of a gender variable, is very useful in predicting in-store behavioral intentions: accounted-for variance was 65.326 percent. Further research is needed to develop a stimulus taxonomy for retail environments that relates to the emotional dimensions, but this study, like that of Donovan and Rossiter, confirms that these emotional states are apparently valid mediating variables with considerable predictive power (Donovan and Rossiter 1982).

This finding presents some particularly useful implications for retail merchandisers. Because consumer behavior is so complex and so dynamic, retailers must become more behaviorally sensitive by shifting their analysis from a simple economics and engineering emphasis to include behavioral data (Markin, et al. 1976). Often, merchandisers emphasize cognitive influences (such as price, location, variety, and quality of merchandise), rather than focusing on the influence of emotional affect on consumers. Donovan and Rossiter (1982) propose that, " whereas cognitive factors may largely account for store selection and for most of the planned purchases within the store, the emotional responses induced by the environment within the store are primary determinants of the extent to which the individual spends beyond his or her original expectations." Retailers may want to pay particular attention to departments frequented by men, since this study suggests that males are more affected by store-induced pleasure than are females. In addition, merchandisers may benefit by creating an atmosphere which is more surprising, rare, and novel, since novelty seems to increase an individual's level of pleasure. Over a period of time, an environment provoking feelings of pleasure may increase sales dramatically!

Because this study is just a starting point for analyzing approach-avoidance behaviors within retail environments, there are many suggestions for future research. First, as noted,

future researchers must devise a stimulus taxonomy for retail environments. The measure of information rate was not a good stimulation measure in this study. A taxonomy that is specifically applicable to in-store factors is needed. Second, individual differences should be taken in consideration, since individual reactions to environments may vary considerably. In addition, respondents of various age groups should be used - both this study and that of Donavan and Rossiter use subjects in the 20 to 24 year old age category. Third, and lastly, the Mehrabian-Russell model should be tested with actual purchasing behavior rather than just with consumer-stated intentions.

APPENDIX A

**SEMANTIC DIFFERENTIAL MEASURES
OF EMOTIONAL STATE**

Instructions to Subjects:

Take a few moments to get into the mood of the situation. Then, using the adjective pairs below, rate your feelings in this setting. Though some of the pairs may seem unusual, you'll probably feel more of one emotion than the other. So, for each pair, place a check mark (Example: _ _ _ ✓ _ _ _ _ _) closest to the adjective which you believe describes your feelings the best. The more appropriate the adjective, the closer the check mark should be placed to that adjective.

Happy	_ _ _ _ _ _ _ _ _	Unhappy
Pleased	_ _ _ _ _ _ _ _ _	Annoyed
Satisfied	_ _ _ _ _ _ _ _ _	Unsatisfied
Contented	_ _ _ _ _ _ _ _ _	Depressed
Hopeful	_ _ _ _ _ _ _ _ _	Despairing
Relaxed	_ _ _ _ _ _ _ _ _	Bored
Important	_ _ _ _ _ _ _ _ _	Insignificant
Free	_ _ _ _ _ _ _ _ _	Restricted
Stimulated	_ _ _ _ _ _ _ _ _	Relaxed
Excited	_ _ _ _ _ _ _ _ _	Calm
Jittery	_ _ _ _ _ _ _ _ _	Dull
Interested	_ _ _ _ _ _ _ _ _	Disinterested
Frenzied	_ _ _ _ _ _ _ _ _	Sluggish
Overcrowded	_ _ _ _ _ _ _ _ _	Uncrowded
Wideawake	_ _ _ _ _ _ _ _ _	Sleepy
Controlling	_ _ _ _ _ _ _ _ _	Controlled
Dominant	_ _ _ _ _ _ _ _ _	Submissive
Influential	_ _ _ _ _ _ _ _ _	Influenced

APPENDIX B

A GENERAL MEASURE OF INFORMATION RATE

Instructions to Subjects:

Please use the following adjective pairs to describe the environment surrounding you. Each of the following adjective pairs helps define the setting or the relations among the various aspects of the setting. Place a check mark closest to that adjective which best describes the environment. Please consider the environment as a whole – do not focus on specific design features or products.

Varied	— — — — — — — — —	Redundant
Simple	— — — — — — — — —	Complex
Novel	— — — — — — — — —	Familiar
Small-scale	— — — — — — — — —	Large-scale
Similar	— — — — — — — — —	Contrasting
Dense	— — — — — — — — —	Sparse
Intermittent	— — — — — — — — —	Continuous
Ordinary	— — — — — — — — —	Surprising
Heterogeneous	— — — — — — — — —	Homogeneous
Uncrowded	— — — — — — — — —	Crowded
Asymmetrical	— — — — — — — — —	Symmetrical
Immediate	— — — — — — — — —	Distant
Common	— — — — — — — — —	Rare
Patterned	— — — — — — — — —	Random

APPENDIX C

VERBAL MEASURES OF APPROACH-AVOIDANCE

1) Would you enjoy shopping in this store?

(0) Not at all   (4) Moderately
(1) Very slightly   (5) Much
(2) Slightly   (6) Very much
(3) Slightly to moderately   (7) Extremely

2) How much time would you like to spend browsing in this store?

(0) None   (4) A few hours
(1) A few minutes   (5) A day
(2) Half an hour   (6) A few days
(3) One hour   (7) Many, many days

3) Would you avoid ever having to return to this store?

(0) Not at all   (4) Moderately
(1) Very slightly   (5) Much
(2) Slightly   (6) Very much
(3) Slightly to moderately   (7) Extremely

4) Is this a place in which you would feel friendly and
    talkative to a stranger who happens to be near you?

(0) Not at all   (4) Moderately
(1) Very slightly   (5) Much
(2) Slightly   (6) Very much
(3) Slightly to moderately   (7) Extremely

5) Would you want to avoid looking around or exploring this
    environment?

(0) Not at all   (4) Moderately
(1) Very slightly   (5) Much
(2) Slightly   (6) Very much
(3) Slightly to moderately   (7) Extremely

6) Do you <u>like</u> this store environment?

(0)	Not at all	(4)	Moderately
(1)	Very slightly	(5)	Much
(2)	Slightly	(6)	Very much
(3)	Slightly to moderately	(7)	Extremely

7) Is this a place where you might try to <u>avoid other people</u>, and avoid having to talk to them?

(0)	Not at all	(4)	Moderately
(1)	Very slightly	(5)	Much
(2)	Slightly	(6)	Very much
(3)	Slightly to moderately	(7)	Extremely

8) Is this the sort of place where you might end up <u>spending more money</u> than you originally set out to spend?

(0)	Not at all	(4)	Moderately more
(1)	Very slightly more	(5)	Much more
(2)	Slightly more	(6)	Very much more
(3)	Slightly to moderately more	(7)	Very, very much more

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