Store Atmosphere: An Environmental Psychology Approach

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Store Atmosphere: An Environmental Psychology Approach

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This study tests the Mehrabian-Russell environmental psychology model in retail settings. The results suggest that store atmosphere, engendered by the usual myriad of in-store variables, is represented psychologically by consumers in terms of two major emotional states—pleasure and arousal—and that these two emotional states are significant mediators of intended shopping behaviors within the store. The practical value of this approach is that retailers may be better able to explain and predict the effects of in-store changes on shopping behavior.

The influence of the environment on behavior has long been acknowledged by landscapers, architects, and interior designers and has occasionally been recognized by far-sighted retailers. More recently, environment-behavior relationships have also been systematically studied by psychologists, producing a rapidly growing discipline known as "environmental psychology." However, environmental psychologists have rarely directed their attention to the retail store environment. Rather, they have studied work environments, residential environments, entertainment environments, and institutional environments such as hospitals, schools, and prisons (Craik 1973; Mehrabian 1976; Stokols 1978). Environmental psychology would appear to have equally strong applications to store environments, and it is the purpose of this study to test a leading environmental psychology approach, the Mehrabian-Russell model, in the retail context.

The focus of our test of the Mehrabian-Russell model (described later) is on store atmosphere, that is, on within-store variables that affect shopping behavior. Previous studies of retail environments have occasionally examined store atmosphere (see especially Kotler 1973 and the *Journal of Retailing* special issue, Winter 1974). However, there are

several important limitations in previous approaches. First, store atmosphere has usually been included as a component of store image, along with other physical in-store variables such as aisle width, brightness, and crowding, when clearly these physical variables are antecedents of store atmosphere rather than alternatives to it. Second, store atmosphere usually has been conceptualized as a single attribute, often with some vague single dimensionality such as "good" atmosphere, when it is likely to be multidimensional. Third, store atmosphere typically has been studied as one factor influencing the consumer's general decision to patronize the store, but no detailed investigation has been made of how store atmosphere affects shopping behavior within the store. In summary, store atmosphere has been poorly conceptualized and narrowly related to shopping behaviors of relevance to retailers.

The actual effects of store atmosphere on shopping behaviors have not been well documented. Some retailers have claimed large effects from manipulating store atmosphere via layout, lighting, color, and music (Wysocki 1979; Stevens 1980), but this evidence is purely anecdotal. Better-controlled investigations by marketers, on the other hand, show small effects but have been based on self-reports. Store atmosphere usually comes out near the bottom of the list when consumers are asked to state its relative importance when compared with more objective variables such as shopping hours, parking access, travel time, product assortment, price, and service (Hansen and Deutscher 1977; Jolson and Spath 1973).

We believe there are several good reasons why researchers have been unable to document strong effects of store atmosphere despite some retailers' claims that these effects exist. Store atmosphere effects are basically emotional states that (1) are difficult to verbalize, (2) are transient and therefore difficult to recall, and (3) influence behaviors within the store rather than gross external behaviors such as choosing whether or not to patronize the store. Most studies have used structured questionnaire surveys wherein respondents are asked to rank-order a preselected list of attributes in terms of their importance for patronage. It is noteworthy that one of the few studies that allowed respondents to verbalize their own descriptions, using free-association techniques and depth interviews, produced a much more emotional set of responses than the usual cognitively dominated set used in structured questionnaires (Dickson and Albaum 1977).

Also, store-atmosphere measurement, often in the context of store image research, has usually occurred well after the in-store experience and in settings external to the store. Because emotional responses are not always readily recallable (especially in a cognitive task context), they

may be extremely difficult to document unless their measurement occurs as close as possible in time and place to the shopping behavior and preferably within the store. Further, we would argue that, whereas emotional responses to the in-store atmosphere certainly contribute to store patronage, albeit not always at a conscious level, atmosphere effects are far more influential on behavior within the store. Several other writers (Tauber 1972; Markin, Illis, and Narayana 1976) appear to agree with this subtle, preconscious, emotional conceptualization of store atmosphere.

If store atmosphere can indeed affect purchasing behavior within the store, then the task is to develop a framework with which to study such effects. Although several researchers have attempted to explore various specific aspects of environment and behavior relationships, no one to our knowledge has applied an overall framework from environmental psychology to the retail field. Belk (1975), Kakkar and Lutz (1975), and Lutz and Kakkar (1975) investigated usage environments but not retail shopping environments. Harrell and Hutt (1976) studied the effects of only one variable, crowding, on shopping behavior. Grossbart et al. (1975) examined personality differences in sensation seeking related to shopping behavior. However, none of these studies offers an overall framework appropriate for exploring environmental variables in retail settings.

THE MEHRABIAN-RUSSELL MODEL

Environmental psychologists (Mehrabian and Russell 1974; Mehrabian 1980; Russell and Pratt 1980) have presented what we consider a potentially valuable theoretical model for studying the effects of store atmosphere on shopping behavior. Using a Stimulus-Organism-Response (S-O-R) paradigm, they offer a parsimonious description of environments, intervening variables, and behaviors relevant to the retail setting. It is the aim of this paper to adapt the Mehrabian-Russell approach to the retail context and to test predictions from their model.

An adequate S-O-R model has the following requisites: a stimulus taxonomy, a set of intervening or mediating variables, and a taxonomy of responses. Stimulus, intervening, and response variables should be conceptually clear, comprehensive yet parsimonious, and operationally measurable. There should be a well-specified expression of the relationship between stimuli and responses via the intervening variables.

The Mehrabian-Russell model is particularly strong in the intervening variable and response areas, but leaves the problem of an appropriate stimulus taxonomy largely untouched. This is not un-

expected in an area such as environmental psychology simply because of the myriad of stimuli that confronts us in any environment. Such environmental complexity need not pose a major obstacle to applying the theory if one regards the first task of research as establishing the validity of the link between the intervening variables and the responses. Given a predictable link between the set of intervening variables and the response taxonomy, it is a matter of empirical research in retail settings to determine the stimulus variations that produce changes in the intervening variables and hence (predicted) changes in behavior. In other words, an attempt can be made later to develop an adequate stimulus taxonomy. Meanwhile, on the practical side, the retailer is able to manipulate in-store stimuli systematically and, via simultaneous measurement of the intervening variables, to predict the probable behavioral consequences of such variations.

Response Taxonomy

Mehrabian and Russell postulate that all responses to an environment can be considered as approach or avoidance behaviors. Approach-avoidance behaviors are considered to have four aspects:

1. A desire *physically* to stay in (approach) or to get out of (avoid) the environment
2. A desire or willingness to look around and to *explore* the environment (approach) versus a tendency to avoid moving through or interacting with the environment or a tendency to remain inanimate in the environment (avoidance)
3. A desire or willingness to *communicate* with others in the environment (approach) as opposed to a tendency to avoid interacting with others or to ignore communication attempts from others (avoidance)
4. The degree of enhancement (approach) or hindrance (avoidance) of *performance and satisfaction* with task performances.

All these aspects can readily be seen to be quite appropriate for describing behaviors in a retail environment. Physical approach and avoidance (1) can be related to store patronage intentions at a basic level. Exploratory approach and avoidance (2) can be related to in-store search and exposure to a broad or narrow range of retail offerings. Communication approach and avoidance (3) can be related to interaction with sales personnel and floor staff. Performance and satisfaction approach and avoidance (4) can be related to repeat-shopping frequency as well as reinforcement of time and money expenditures in the store.

Emotional States as Intervening Variables

Mehrabian and Russell propose that three basic emotional states mediate approach-avoidance behaviors in environmental situations. These emotional responses, known by the acronym PAD, are:

*P*leasure — Displeasure
*A*rousal — Nonarousal
*D*ominance — Submissiveness

Their model posits that any environment, including that of a retail store, will produce an emotional state in an individual that can be characterized in terms of the three PAD dimensions, which are factorially orthogonal. Pleasure-displeasure refers to the degree to which the person feels good, joyful, happy, or satisfied in the situation; arousal-nonarousal refers to the degree to which a person feels excited, stimulated, alert, or active in the situation; and dominance-submissiveness refers to the extent to which the individual feels in control of, or free to act in, the situation.

Mehrabian and Russell provide considerable empirical support for their three intervening variables, including physiological support. They also point to Osgood's findings (Osgood, Suci, and Tannenbaum 1957) that three dimensions (evaluation, activity, and potency) adequately account for people's cognitive interpretations of various physical objects and social events, as support for their notion that three emotional dimensions are sufficient to account for the wide variety of people's emotional responses to environmental stimuli. It is also of some interest that a tridimensional theory of emotions was proposed by the pioneering psychologist Wilhelm Wundt more than 60 years ago. Wundt argued that all emotions could be characterized in terms of pleasure-displeasure, tension-relaxation, and excitement-quiescence (Mandler 1979). It is clear that there is a great deal of similarity between the three tridimensional systems, although only Wundt's and the Mehrabian-Russell system are specifically designed to deal with emotion.

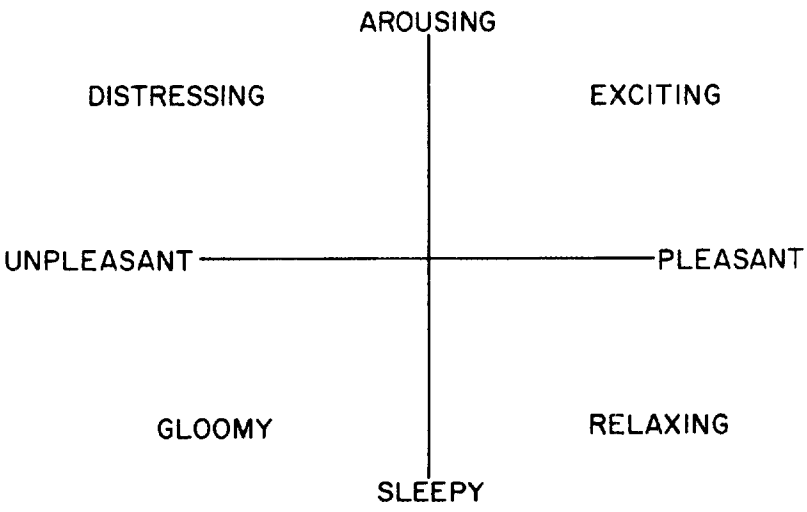
Recently, Russell and Pratt (1980) have proposed a modification of the Mehrabian-Russell theory that deletes the dominance dimension. Although evidence for the suitability of the pleasure and arousal dimensions appears very convincing over a broad spectrum of situations, evidence for the dominance dimension is more tenuous. In his later work, Russell has argued that dominance requires a cognitive interpretation by the person and is therefore not purely applicable in situations calling for affective responses. Russell and Pratt (1980) found that the two orthogonal dimensions of pleasure and arousal (pleasant-unpleasant, arousing-sleepy) were adequate to represent people's emo-

tional or affective responses to a wide range of environments. Russell and Pratt's two-dimensional scheme also identifies two *correlated* dimensions resulting from the interactions of the basic two, producing an eight-descriptor "circumplex" model of emotional reactions to environments (Figure 1). In Russell and Pratt's scheme, any emotional-state descriptor can be characterized as a vector from the (no emotion) origin. For purposes of this study, however, we decided to retain Mehrabian and Russell's initial tridimensional (PAD) classification.

The PAD dimensions are orthogonal. However, the Mehrabian-Russell model specifies a conditional *interaction* between pleasure and arousal in determining approach-avoidance. In a neutral (i.e., neither pleasing nor displeasing) environment, moderate arousal enhances approach behaviors, whereas very low or very high arousal leads to avoidance behaviors. In a pleasant environment, the greater the arousal, the greater the approach behavior. In an unpleasant environment, the higher the arousal, the greater the avoidance behavior. Thus, although the PAD, dimensions are factorially orthogonal, pleasure and arousal are hypothesized to interact in this specified manner.

FIGURE 1

Two Dimensions of Emotion and Eight Major Emotional States



Source: Russell and Pratt (1980).

Stimulus Factors

As previously noted, the development of an adequate stimulus taxonomy for research in environmental psychology has proven extremely difficult because of the many stimuli involved in any environmental setting. Clearly, a great deal of in-store experimentation will be needed to determine which specific types of in-store stimulus configurations (such as color arrangements, store layouts, noise levels, lighting, in-store promotions) evoke which types of emotional responses so as to result in approach or avoidance behaviors. Our suggested experimental approach discusses this problem further.

Borrowing from information theory, Mehrabian and Russell (1974) proposed a *general* (i.e., nonspecific) measure of environmental stimulation applicable across many and various physical and social settings: the information rate or "load" of an environment. They defined the load of an environment as its degree of novelty and complexity. Novelty involves the unexpected, the surprising, the new, the unfamiliar. Complexity refers to the number of elements or features and to the extent of motion or change in an environment. In Mehrabian and Russell's model, the load of an environment is assumed to be directly related to the degree of arousal induced by the environment. A high-load environment (i.e., novel, surprising, crowded) will make a person feel stimulated, excited, and alert. On the other hand, a low-load environment will result in feelings of calm, relaxation, or even sleepiness.

However, an individual's arousal response to the load of an environment will also be mediated by his or her characteristic way of responding to external information. Mehrabian and Russell, and especially Mehrabian, have paid particular attention to individual differences in arousability. Mehrabian relates individual differences on the arousal dimension to individual differences in the extent to which people screen or filter incoming stimuli. "Screeners" (one pole of the dimension) are relatively selective in what they attend to; they automatically screen out less important components of the environment. They are less distracted by novel stimuli and tend to impose a patterning on the features of a complex environment. In short, they reduce the load or information rate of the environment. "Nonscreeners" (the other pole of the dimension) are less selective in what they respond to and experience situations as more complex and novel than do screeners. Nonscreeners are far more aroused (and remain so) by novel, intense stimuli than are screeners. In a very real sense, they are relatively more sensitive to stimulus changes or variations than are screeners.

Mehrabian and Russell are not the only authors to hypothesize an information rate-arousal relationship in human behavior. For example, Markin et al. (1976) note that much of human activity is directed toward increasing the level of incoming stimulation and suggest creating a "psychology of stimulation" for retail stores. Grossbart et al. (1975) have attempted to relate personality differences in the desire for stimulation (via Zuckerman's Sensation-Seeking Scale) to perceptions of, and behaviors within, the retail store. Persons scoring high on Zuckerman's scale (high sensation seekers) are assumed to prefer complex, changing, unstructured environments; hence, they would be more likely to prefer shopping in high-load environments than in low-load environments. Grossbart et al. also argue that, because high sensation seekers have a greater need for stimulation, they are also likely to be more sensitive to stimulus features of the environment than low sensation seekers. However, they do not provide strong support for either of these notions. Mehrabian and Russell's model has an advantage over these other approaches in that it specifies how individual differences are expected to relate to the other variables in their system.

Summary of the Mehrabian-Russell Model

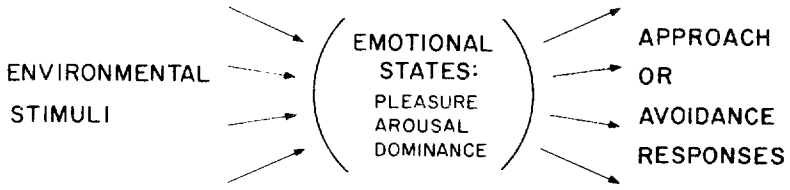
Behavior toward and within an environment can be classified as either approach or avoidance behavior. Approach behaviors relate to a willingness or desire to move towards, stay in, explore, interact supportively in, perform well in, and return to the environment. Avoidance behaviors relate to the opposites of the above: deteriorated performance and dissatisfaction; feelings of anxiety or boredom; unfriendliness to others; and a desire to leave the environment and not to return.

Such behaviors are a result of the emotional states an individual experiences within the environment. All emotional states, according to the Mehrabian-Russell model, can be represented by some combination of two major dimensions—pleasure and arousal—and to some extent, a third, dominance. Pleasure and arousal are hypothesized to interact in such a way that arousal amplifies approach behavior in pleasant environments and avoidance behavior in unpleasant environments.

An appropriate stimulus taxonomy of the physical features of the environment that arouse these emotions is not available in the M-R model, although there is much "anecdotal" evidence from other sources about what does and does not affect emotional behavior. However, the M-R model takes general account of stimulus factors in that the degree of arousal evoked by an environment is considered to

FIGURE 2

The Mehrabian-Russell Model



be a direct function of the information load of the situation. Information load is further modified by the individual's characteristic way of responding to external stimulation. Persons who tend to screen out much irrelevant stimulation are less aroused by a given load than are nonscreeners, and vice versa.

Figure 2 summarizes the Mehrabian-Russell model. In general retailing terms, the model predicts that persons will enjoy spending more time and perhaps more money in those retail stores where they feel pleasure and a moderate to high degree of arousal.

METHOD

Overview

This study applies the Mehrabian-Russell model to retail environments. The study was limited to establishing the relationship between *emotional states* induced in a retail environment and statements of *behavioral intention* in that environment. Given that the M-R model could adequately represent such a relationship, we envisaged future research to delineate store-induced emotional states more precisely and to develop actual behavioral measures.

Sample

Three sampling frames were involved in the design: respondents, retail environments, and time of day. Thirty graduate business students served as subjects. Each person was randomly allocated to two or three retail environments. The environments were selected to cover several types of retail outlet. Respondents were instructed to visit each retail

store on a different day and at a different time of day so as to ensure various shopping times (e.g., Saturday morning, lunchtime, late after

TABLE 1

Types of Retail Outlets Visited

Type	Number of observations
Full-line department store	19
Clothing, shoe boutique	6
Hardware, electrical appliances	6
Craft shop, bookstore	6
Liquor, wine store	6
Delicatessen, fast foods	5
Limited-line department store, large clothing store	5
Sporting goods	5
Hi-fi, records	3
Drugstore	3
Supermarket	2
Total	66

noon, evening). Table 1 lists the types of retail outlets and the number of observations for each type. In total, the sample consisted of n = 66 observations.

Procedure

Respondents entered each store and proceeded to a central point in the store; for multilevel stores, this was on the first floor. They then completed questionnaire ratings (below) while in the store.

Measures

The questionnaire contained three major parts. Part I assessed respondents' emotional states while in the store, using Mehrabian and Russell's (1974) PAD semantic differential measure, but with several of the original dominance items (in control-cared for, autonomous-guided, important-awed) replaced by more context-appropriate scales (restricted-free, crowded-overcrowded, important-insignificant). These statements appear in Table 2. Part II of the questionnaire consisted of Mehrabian and Russell's (1974) General Measure of Information Rate,

which measures the environmental "load" factor (see Table 3). Part III measured respondents' intentions to behave in the store. The questions here were adapted (to fit retail shopping intentions) from the sorts of questions used by Mehrabian and Russell to measure general approach-avoidance intentions:

(1) Would you *enjoy* shopping in this store?
(2) How much *time* would you like to spend browsing in this store?
(3) Would you avoid ever having to *return* to this store?
(4) Is this a place in which you would feel *friendly* and talkative to a stranger who happens to be near you?
(5) Would you want to avoid looking around or *exploring* this environment?

TABLE 2

Factor Analysis Results for the 18 Pleasure-Arousal-Dominance Measures[a]

Measure	Factor loadings[b] I	II	III
Contented-Depressed	.87	—	—
Happy-Unhappy	.85	—	—
Satisfied-Unsatisfied	.81	—	—
Pleased-Annoyed	.76	—	—
Relaxed-Bored	.71	—	—
Important-Insignificant	.68	—	—
Free-Restricted	.63	—	—
Hopeful-Despairing	.52	—	.33
Stimulated-Relaxed	—	.79	—
Excited-Calm	—	.77	—
Jittery-Dull	—	.74	—
Aroused-Unaroused	—	.73	—
Frenzied-Sluggish	—	.70	-.35
Overcrowded-Uncrowded	—	.67	—
Wideawake-Sleepy	.48	.51	—
Controlling-Controlled	—	-.32	.75
Dominant-Submissive	—	—	.54
Influential-Influenced	—	—	.53
Variance	33.1%	23.2%	8.1%

[a] Three factors with eigenvalues ≥1.0 accounted for 64.4 percent of the variance.
[b] Loadings ≤ .3 not shown.

TABLE 3

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

Measure	Factor loadings[b] I	II	III	IV	V
Usual-Surprising	.80	—	—	—	—
Common-Rare	.86	—	—	—	—
Familiar-Novel	.64	.32	—	—	—
Homogeneous-Heterogeneous	—	.80	—	—	—
Redundant-Varied	—	.74	—	—	—
Similar-Contrasting	.35	.45	—	—	—
Symmetrical-Asymmetrical	—	—	.89	—	—
Patterned-Random	.46	—	.71	—	—
Sparse-Dense	—	—	—	.69	—
Continuous-Intermittent	—	—	—	-.53	—
Distant-Immediate	—	—	—	.48	—
Uncrowded-Crowded	—	—	—	.47	—
Small scale-Large scale	—	—	—	—	.80
Simple-Complex	.49	—	—	—	—
Variance	31.8%	13.3%	12.1%	7.5%	7.4%

[a]Five factors had eigenvalues ≥1.0 accounting for 72.1 percent of the variance.
[b]Loadings ≤.3 not shown.

(6) Do you *like* this store environment?
(7) Is this a place where you might try to *avoid other people*, and avoid having to talk to them?

A further question was added to gauge intended spending behavior:

(8) Is this the sort of place where you might end up *spending more money* than you originally set out to spend?

ANALYSIS AND RESULTS

The main aim of the analysis was to determine the extent to which subjects' approach-avoidance responses could be predicted from their reported emotional states (PAD) while in the various retail environments. Another aim was to assess the joint effect of degree of arousal experienced in the environment and perceived information rate (a stimulus factor in the Mehrabian-Russell model) and in predicting approach-avoidance responses.

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 PAD measures, the 8 approach-avoidance responses, and the 14 information-rate items. Results of these respective factor analyses appear in Tables 2, 3, and 4. Reliability estimates (coefficient alpha) for the various factor-based indices appear in table 5.

Pleasure-Arousal-Dominance. The three factors resulting from the 18 PAD measures are clearly identifiable as pleasure, arousal, and dominance (Table 2). The dominance factor is quite weak. This is partially because the three intended dominance items loaded instead on the pleasure factor (free-restricted, important-insignificant) and the arousal factor (overcrowded-uncrowded). The relative insignificance of the dominance dimension is consistent with Russell's recent work (Russell and Pratt 1980). Overall, then, the Mehrabian-Russell scales of pleasure and arousal (especially) and dominance that were developed in the laboratory situation retained their nature and factorial independence in real-life retail environments.

For later analysis, we computed pleasure, arousal, and dominance scores for each subject by computing the average of the five highest loading items on factors I and II and the three highest loading items on factor III, respectively (Table 5). These scores were then designated as Pleasure, Arousal, and Dominance. For factors I and II, the items each had loadings of .70 or higher. For factor III, the weak dominance factor, the choice was either one item higher than .70 or this item plus two others; in view of the fact that adding items increases reliability, we chose the latter course. Reliability coefficients (alpha) were acceptably high for Pleasure (.90) and Arousal (.86), but the lower reliability of Dominance (.65) suggests caution in generalizing from this measure.

Approach-Avoidance Responses. The factor analysis of the eight dependent measures yielded only one factor with an eigenvalue greater than 1.0 (Table 4). This factor appears to capture approach-avoidance but more in the Fishbein and Ajzen (1975) sense of "attitude toward the act" than of intentions per se. The factor seems highly loaded with affect. From a theoretical viewpoint, a unidimensional scale is very desirable. However, Mehrabian and Russell (1974) have found that the affiliative responses in their scale are generally quite independent of the other approach-avoidance responses. Hence, we looked at the first three factors of this solution. Table 4 shows that the affiliation items (and, even more so, the time and money items) are, in fact, somewhat independent of the other approach-avoidance items.

TABLE 4

Factor Analysis Results for the Approach-Avoidance (and Spending) Measures[a]

Measure	Factor loadings[b] I	II	III
Do you *like* the environment?	.86	—	—
Would you *enjoy* shopping in this store?	.80	—	—
Would you avoid *returning?* (reverse scored)	.71	—	.33
Feel *friendly* to a stranger?	.47	.60	—
Avoid other *people?* (reverse scored)	.46	.58	—
Spend more than you set out to?	—	.70	.39
How much *time* browsing?	—	—	.81
Avoid *exploring?* (reverse scored)	.49	.32	.40
Variance	56.2%	12.0%	10.6%

[a]Only factor 1 had an eigenvalue ≥1.0 (see text for explanation of three-factor solution). The first three factors accounted for 78.8 percent of the variance

[b]Loadings ≤.3 not shown.

TABLE 5

Reliability Estimates (Coefficient Alpha) for Index Measures

Dependent measures	α	Information-rate measures	α	PAD measures	α
APR-AVD	.88	Novelty	.85	Pleasure	.90
Affect	.90	Variety	.78	Arousal	.86
Time	.67	Irregularity	.84	Dominance	.65
Affiliation	.72	Density	.40		
Spend	—[a]	Size	—[a]		

[a]Single-item measure, alpha not applicable.

For later analysis, we computed several dependent variable scores for each subject: APR-AVD (the average of all the approach-avoidance responses but excluding the "spend" item); *spend* (the "spend" item alone); *affect* (the average of the three highest loading items, like, enjoy, return, on factor I); *affiliation* (the average of the two affiliation items, friendly to strangers and avoid talking to people); and *time* (the average of the two time-related items, time browsing and avoid exploring). Reliability coefficients for APR-AVD (.88) and *affect* (.90) were acceptably high. However, those for *time* (.67), *affiliation* (.72), and *spend* (not applicable) indicate caution in generalizing relationships pertaining to these three dependent variables.

So, whereas the finding of a reasonably unidimensional approach-avoidance response measure is encouraging, the unidimensionality of approach-avoidance seems to be due to its higher-order factorial position relative to several subfactors. For example, while our spending-intentions measure is significantly related to the Mehrabian-Russell type approach-avoidance responses (individual correlations with *spend* ranged from .35 to .48, all $p < .01$), the shared variance is quite low. Hence, we feel justified in focusing on the various subscales for the remainder of the analysis.

Information Rate. Theoretically, the information rate in an environment should be a unidimensional variable. However, Mehrabian and Russell's (1974) studies suggest the presence of at least 3 dimensions among their 14 measures. These might be designated "novelty" (common-rare, familiar-novel, usual-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). Our factor analysis yielded five factors with eigenvalues greater than 1.0 (Table 3). We have labeled these factors "novelty" (coinciding precisely with the "novelty" factor above), "variety," "irregularity," "density" (with the continuous-intermittent item reversed because of its negative loading), and "size."

Our results suggest that some of these information-rate measures may not be appropriate measures of information rate in retail environments because subjects may be applying the different adjectives to quite different and specific aspects of the situations. For example, a regular layout of aisles, shelving, and displays may be described as "simple" and "symmetrical"; but the products they contain may be described as "heterogeneous," "varied," and "contrasting." That is, focusing on specific layout or design features, these measures may simply be descriptors of the environment that only tenuously reflect

information rate and hence may be quite unrelated to inducing arousal in the individual.

For later analysis, we defined five information-rate measures: *novelty* (average of usual-surprising, common-rare, familiar-novel); *variety* (average of homogeneous-heterogeneous, redundant-varied); *irregularity* (average of symmetrical-asymmetrical, patterned-random); *density* (average of sparse-dense, intermittent-continuous); and *size* (small scale-large scale). Reliability coefficients for *novelty* (.85) and *irregularity* (.84) are acceptably high, and that for *variety* (.78) is nearly so. The unreliability of the *density* (.40) and *size* (not applicable) measures, however, means that their relationships with other variables should be regarded as tentative.

Regression Analysis Results

PAD and Approach-Avoidance. Table 6 shows the regression of the Pleasure, Arousal, and Dominance dimensions against each of the previously defined dependent variables. In keeping with Mehrabian and Russell's findings, Pleasure is clearly the major predictor of APR-AVD (the general dependent measure that includes all items except the *spend* item). Perceived pleasantness of the within-store environment is the only significant predictor in the PAD equation with the equation itself accounting for a substantial 44 percent of the variation in intended approach-avoidance behaviors in the retail stores. Not sur-

TABLE 6

Beta Coefficients for the PAD Dimensions Used to Predict the Approach-Avoidance and Spend Responses

	Response				
Dimension	APR-AVD	Affect	Time	Affiliation	Spend
Pleasure	.67[a]	.72[a]	.51[a]	.44[a]	.40[a]
Arousal	.13	.00	.17	.22[b]	.13
Dominance	.00	.03	-.04	.01	-.15
Multiple R	.68[a]	.73[a]	.52[a]	.49[a]	.40[b]
R^2 (adjusted)	.44	.50	.24	.20	.12

[a] $p < .01$.
[b] $p < .05$
Note: Since coefficient signs were specified directional hypotheses, one-tailed tests were used.

prisingly, the predictive power of Pleasure is even further enhanced for the *affect* subscale of approach-avoidance. Affect toward the store atmosphere is strongly related to affect (or attitude) toward behaviors performed in the store. Pleasure also shows moderate relationships with the more specific within-store behavioral intentions *time, affiliation,* and *spend.* The lower relationships could be partly attributable to the lower reliability of these three dependent measures. The stronger APR-AVD and *affect* relationships with Pleasure, on the other hand, can be safely generalized.

Arousal is not significantly related to approach-avoidance with the particular exception of affiliation. However, it should be recalled from the M-R model that Arousal is hypothesized to interact conditionally with Pleasure. We examined this hypothesis by computing two regressions (Table 7): one for pleasant environments (Pleasure scores above zero) and another for unpleasant environments (Pleasure scores zero and below). It should be noted that this sample split resulted in an adequate subsample for pleasant environments (n = 46) but a severely restricted subsample for neutral or unpleasant environments (n = 20). This is not unexpected, as most retailers would assiduously avoid the creation of unpleasant store environments.

The split-sample regressions provide reasonable support for the Pleasure-Arousal interaction hypothesis. In pleasant retail environments, Arousal now emerges as a significant predictor of *approach* intentions for APR-AVD, *time,* and *affiliation* (with the latter being the only significant result in the general regression earlier). The Arousal regression coefficient for *spend* is also in the right direction but does not reach significance. The Arousal regression coefficient for *affect* is near zero, but we would expect this affective dependent variable to be mainly related to Pleasure (which it is) rather than Arousal.

Of particular interest is the finding that given a pleasant store environment, Arousal now becomes the key mediator of intentions to spend *time* in the store. Moreover, both the general results and the pleasant environment results indicate a positive relationship between Arousal and *affiliation.* The implication of the arousal-affiliation relationship is that more highly aroused shoppers will be more likely to interact with other people in the store —including, presumably, sales personnel. In-store stimuli that may increase arousal, such as bright lights or rock music, may therefore induce customers to spend more time in the store and to interact more with sales personnel, thereby increasing the probability of sales.

The results for the other "half" of the Pleasure-Arousal interaction

TABLE 7

Beta Coefficients for the PAD Dimensions Used to Test the Pleasure-Arousal Interaction

	Response				
	APR-AVD	Affect	Time	Affiliation	Spend
Pleasant environments					
Pleasure	.44[a]	.49[a]	.21	.39[a]	.34[a]
Arousal	.28[b]	.07	.40[a]	.24[b]	.18
Dominance	-.15	-.15	-.14	-.09	-.17
Multiple R	.54[a]	.48[a]	.49[a]	.47[a]	.40[b]
R^2 (adjusted)	.24	.17	.18	.17	.10
Neutral or unpleasant environments					
Pleasure	.17	.31	.18	-.18	.32
Arousal	.01	.02	-.13	.18	.07
Dominance	.31	.30	.15	.24	-.22
Multiple R	.41	.53	.33	.27	.31
R^2 (adjusted)	.01	.15	.00	.00	.00

[a] $p < .01$.
[b] $p < .05$.
Note: One-tailed tests were used.

do not, at first, seem to support the hypothesis. The regression coefficients for Arousal are essentially zero, whereas they were hypothesized to be significantly negative (i.e., indicating avoidance intentions). However, this outcome must be interpreted in light of the restricted subsample as well as the realization that we had to include neutral environments with unpleasant environments to make the test possible. To the extent that the environments were restricted in terms of unpleasantness, the neutral outcome for Arousal can be regarded as not inconsistent with the interaction hypothesis.

Dominance, the third PAD measure, is not significantly related to any of the approach-avoidance measures. The general regression results (Table 6) do, however, show a slight negative relationship between Dominance and *spend.* The negative sign indicates that a feeling of submissiveness may accompany the anticipation of spending more money than intended. This finding is very tentative because it is based on two of the weakest measures (alpha $<.7$). But, if true, the

submissiveness-spending trend suggests a possible reconceptualization of the dominance factor in retail settings in terms of a potential "persuasive atmosphere" factor. Generally, however, the failure of the Dominance dimension to predict approach-avoidance intentions is consistent with the later tests of the PAD model reported by its originators.

In sum, the PAD emotional states correlate quite strongly with some approach-avoidance intentions in retail stores (R^2s ranged from .12 to .50). The relationship is strongest for the Pleasure state and for intentions which could be alternatively characterized as attitudes toward (shopping) actions (Fishbein and Ajzen 1975), although the explained variance for the more specifically behavioral intentions regarding time spent in the store, affiliative or interpersonal interaction tendencies, and estimated monetary expenditures is not insubstantial. The relationship for the Arousal state is also quite strong but only when the pleasure-arousal interaction specified by the M-R model is taken into account. Arousal is more strongly related to intentions than to attitudes toward actions, notably time spent in the store and interpersonal interaction tendencies. As in recent studies, the Domi-

TABLE 8

Beta Coefficients for PAD and Information-Rate Dimensions Used to Predict Approach-Avoidance Responses

	Response				
Dimension	APR-AVD	Affect	Time	Affiliation	Spend
Pleasure	.67[a]	.67[a]	.51[a]	.50[a]	.40[a]
Arousal	.08	-.01	.02	.23	-.03
Dominance	.03	.06	.01	.00	-.11
Novelty	.16	.18	.17	.05	.08
Variety	.00	.00	.08	-.09	.05
Irregularity	.09	-.09	.18	.21	.17
Density	-.07	-.04	-.03	-.12	.07
Size	.07	-.05	.30[b]	-.01	.33[b]
Multiple R	.71[a]	.74[a]	.67[a]	.55[a]	.55[a]
R^2 (adjusted)	.44	.49	.37	.20	.21

[a] $p < .01$
[b] $p < .05$.
Note: One-tailed tests were used

nance state adds little to prediction of approach-avoidance behaviors, although the measure of dominance adapted to retail environments needs further refinement.

Information Rate, PAD, and Approach-Avoidance. Table 8 shows the regression of the dependent measures on the PAD dimensions with the addition of the information-rate measures. The multiple R and adjusted R^2 for the *time* and *spend* variables are increased somewhat, but the others are largely unaffected.

The following aspects of the information-rate results are worthy of note and follow-up research. The larger the "scale" of the environment, the more subjects report they would stay longer in the environment. The reason may be that, other things being equal, a larger environment would take more time to explore. Moreover, larger-scale environments are also more likely to induce subjects to report that they would spend more money than they intended to. This may be a function of an expected greater variety of goods available and, hence, a greater probability of an impulse purchase. The admission of this intent seems significant for retailers. These results therefore suggest (although marginally) that the perceived information rate of an environment goes beyond "straight" arousal by producing specific approach-avoidance responses to that environment.

The theoretical implications of the information-rate and arousal finding for the Mehrabian-Russell model, however, are not so en-

TABLE 9

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

Information-rate dimension	Beta
Novelty	.35[a]
Variety	-.31[b]
Irregularity	-.03
Density	.21[c]
Size	.39[a]
Multiple R	.56[a]
R^2 (adjusted)	.25

[a] $p < .01$.
[b] "Significant" at .01 but sign opposite to prediciton, hence nonsignificant
[c] $p < .05$.
Note: One-tailed tests were used.

couraging. According to their model, arousal is a direct response to the information rate in the environment. (Hence, the information-rate measures should have added little or nothing to the adjusted R^2s.) However, in this study, and probably for reasons mentioned earlier, perceived information rate is not a good predictor of an individual's level of arousal. Table 9 shows an adjusted R^2 of only .25 for the regression of the information-rate measures on Arousal. Three information-rate measures *(novelty, density,* and *size)* increase Arousal, but one measure *(variety)* decreases it, while another *(irregularity)* has no significant relationship with Arousal. It may be remembered that at least two of the five information-rate measures were of questionable reliability. This fact may have somewhat reduced their predictive potential. Nevertheless, we conclude that Arousal is to some extent a function of the information rate in the environment, but not nearly to the extent implied by the M-R model.

CONCLUSIONS

Overall, this study suggests that the Mehrabian-Russell model is a promising starting point for studying approach-avoidance behaviors within retail environments. It is just a starting point because the study was strictly correlational rather than experimental. Furthermore, our experimental resources enabled us to test the model only with stated behavioral intentions rather than with actual behaviors. The following implications should be interpreted with these caveats in mind.

This study suggests that simple *affect,* or store-induced *pleasure,* is a very powerful determinant of approach-avoidance behaviors within the store, including spending behavior. The influence of emotional affect is often overlooked in retail store selection studies where cognitive influences (such as price, location, variety, and quality of merchandise) are emphasized. It is our contention 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. Pilot studies are currently under way to investigate this contention more directly.

Our results further suggest that *arousal,* or store-induced feelings of alertness and excitement, can increase time spent in the store and also willingness to interact with sales personnel. In-store stimuli that induce arousal are fairly easy to identify and almost certainly include bright lighting and upbeat music. However, as predicted by the M-R model,

inducement of arousal works positively only in store environments that are already pleasant; arousal-inducement may have no influence (or even a negative influence) in unpleasant store environments.

The third variable in the M-R model, *dominance,* does not seem to relate well to in-store behaviors. Our findings suggest a possible reconceptualization of the dominance variable in terms of the perceived "persuasiveness" of store atmosphere. However, this seems to make the variable more cognitive and less the purely emotional state that the M-R model requires. Dominance measures also acquire some ambiguity in retail settings, which may lessen their predictive value. The theoretical and practical relevance of dominance for the prediction of shopping behaviors therefore remains undetermined.

To summarize, the PAD (or PA) part of the Mehrabian-Russell model performs surprisingly well in predicting in-store behavioral intentions: accounted-for variance ranged from 12 to 50 percent. Retailers should be pleased with *any* increase in positive customer intentions (time in store, interaction with sales staff, and discretionary spending) provided they can be achieved at low cost. Further work is needed to develop a taxonomy of in-store stimuli that relate systematically to the PAD dimensions, but we now know that these emotional states are apparently valid mediating phenomena with considerable predictive power.

We conclude with some suggestions for future research. First, measurement of emotional states must occur in the actual retail setting and as close to the time of shopping as possible. Induced emotions are transient, so it is not surprising that our in-store measures produced much stronger results than measures of recalled or imagined situations (Lutz and Kakkar 1975). Second, individual differences should be pursued; they were ignored in our study, but Mehrabian's recent work, in particular, suggests that individual reactions to environments may differ substantially. Third, as noted, there remains the complex task of developing a stimulus taxonomy for retail environments (the "S" in the S-O-R model). Mehrabian and Russell's stimulation measure of information rate or "load" did not predict well in the present study and, more practically, retailers need a taxonomy that applies to manipulative in-store factors. Finally, this promising model needs to be tested not just with customer-stated intentions but also with actual purchasing behavior.

EXECUTIVE SUMMARY

How do consumers react to "store atmosphere"? This paper pro-

poses that consumers experience in-store environments in terms of two major emotional dimensions: arousal (arousing-sleepy) and pleasantness (pleasant-unpleasant). The two emotional reactions, in turn, influence the consumer's shopping-related intentions within the store, namely:

1. Enjoyment of shopping in the store
2. Time spent browsing and exploring the store's offerings
3. Willingness to talk to sales personnel
4. Tendency to spend more money than originally planned
5. Likelihood of returning to the store (future patronage)

A central aspect of this proposal (which follows a theory of environmental psychology developed by Mehrabian and Russell) is that the two emotional states *interact* with each other. Specifically, arousal intensifies pleasant reactions, but it also intensifies unpleasant reactions.

The arousal-pleasantness theory was tested by having students visit and rate 66 retail environments in terms of arousal and pleasantness, as well as list their personal intentions to engage in the five types of shopping-related behaviors in each store. Good support was obtained for the theory. Shopping-related intentions increased when pleasant stores were also arousing. In stores that were neutral or unpleasant, arousal did not increase shopping-related intentions.

Some practical implications follow from these findings. If consumers rate your store as pleasant, then their enjoyment, shopping time, spending, etc., can be increased by raising the arousal level of the store's atmosphere with bright lighting, upbeat music, and so forth. However, if your store cannot easily be made pleasant—if it is, perhaps, an industrial outlet or a bargain-basement operation—then the arousal level should be kept low through the use of subdued lighting, spaced displays, and relaxing music or no music at all.

Although this was only a preliminary test of the arousal-pleasantness theory, it looks promising for retailers. Consumer ratings of pleasantness and arousal are easy to obtain. Moreover, variations in retail store layouts and other in-store changes seem to exert their impact through just these two consumer reactions, in the "up or down" way specified by the theory: In a pleasant store, try to increase the arousal level; in a neutral or unpleasant store, try to tone it down.

The broader implication of this research is that retailers should consider the emotional feelings of shoppers, and not just their thinking. The correct emotional combination of pleasantness and arousal created by store atmosphere can stimulate shopping behavior within the store.

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