

# The Effects of Music in a Retail Setting on Real and Perceived Shopping Times

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*This article extends research linking shopping behavior to environmental factors through changes in emotional states. With time fixed or variable during a simulated shopping experiment, shoppers were exposed to music varying by degree of familiarity. Afterward, subjects reported their perceptions of shopping duration, their emotional states, and their merchandise evaluations. Analyses revealed that individuals reported themselves as shopping longer when exposed to familiar music but actually shopped longer when exposed to unfamiliar music. Shorter actual shopping times in the familiar music condition were related to increased arousal. Longer perceived shopping times in the familiar music condition appear related to unmeasured cognitive factors. Although emotional states affected product evaluations, these effects were not directly related to the music manipulations. J BUSN RES 2000. 49:139–147. © 2000 Elsevier Science Inc. All rights reserved.*

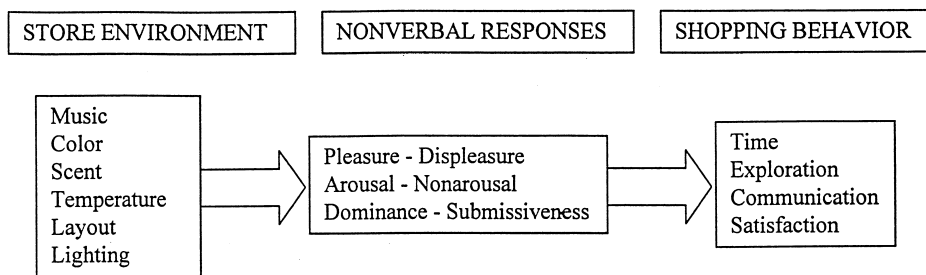
Philip Kotler introduced the view that retail environments create atmospheres that affect shopping behavior in the *Journal of Retailing* in 1973 (Kotler, 1973). Although a special issue devoted to the subject (*Journal of Retailing*, Winter 1974) followed shortly, the area did not otherwise receive much attention. Donovan and Rossiter (1982) revived interest by suggesting that environmental psychology, especially Mehrabian and Russell's (Mehrabian and Russell, 1974) PAD framework, could be used productively to research store environments. Researchers subsequently analyzed retail shopping behavior with this framework and found significant relationships between emotional states and time spent in the store, propensity to make a purchase, and satisfaction with the experience (e.g., Dawson, Bloch, and Ridgway, 1990; Kellaris and Kent, 1993; Yalch and Spangenberg, 1993; Sherman, Mathur, and Smith, 1997).

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Presented at the Symposium on Retail and Service Environment Atmospherics Research, October 1997.

For example, Sherman, Mathur, and Smith (1997) interviewed shoppers immediately after a purchase and solicited responses regarding their perceptions of the store, shopping experience, their mood, and demographic characteristics. They found positive relationships between shoppers' reported mood and how favorably shoppers perceived the store, how many items they purchased, and how much time they spent in the store. Unfortunately, as a correlational study, cause and effect was indeterminate. Given the extensive psychological research showing that individuals partially judge their emotional states by their behavior (e.g., Schachter and Singer, 1962; Bem, 1972), the causal role of emotional reactions to environmental factors in determining shopping behaviors remains uncertain.

Experimental control of environmental factors provides a better, more controlled, test of atmospheric factors and the moderating role of subsequent emotional states on shopping behavior. Several studies have manipulated atmospheric factors, such as crowding (e.g., Harrell, Hutt, and Anderson, 1980; Eroglu and Harrell, 1986; Eroglu and Machleit, 1990; Hui and Bateson, 1991), colors (e.g., Bellizzi, Crowley, and Hasty, 1983), music (e.g., Milliman, 1982, 1986; Yalch and Spangenberg, 1988, 1993; Dube, Chebat, and Morin, 1995; Kellaris and Altsech, 1992), and olfactory cues (Spangenberg, Crowley, and Henderson, 1996) and tested their effects on shopping behaviors like satisfaction with the shopping experience (e.g., Bellizzi, Crowley, and Hasty, 1983; Eroglu and Machleit, 1990), purchase quantity (Milliman, 1982, 1986), shopping times (Milliman, 1982, 1986; Yalch and Spangenberg, 1988; Kellaris and Altsech, 1992), and intention to visit the store again (Spangenberg, Crowley, and Henderson, 1996). However, with few exceptions (e.g., Yalch and Spangenberg, 1988; Hui and Bateson, 1991; Dube, Chebat, and Morin, 1995), these studies have not examined the emotional states of pleasure, arousal, and dominance postulated by Donovan and Rossiter (1982) as factors mediating the effect of retail environments on behavior.



**Figure 1.** A framework integrating store environmental factors, nonverbal responses, and shopping behaviors.

The current article reports a study of retail shopping that includes all three aspects considered important in studies of environmental psychology: environmental stimuli, emotional reactions, and shopping behavior. Shoppers listened to store music varying in its familiarity while they examined various articles of outdoor clothing. Our objective was to learn whether store music influenced shoppers' emotional states and, if so, whether these emotional states subsequently affected shopping behavior. Specific influences measured included time spent shopping, perception of the amount of shopping time, and actual product evaluations.

## Environmental Psychology In Retailing

Mehrabian and Russell (1974) developed a framework for analyzing the effects of environments on individuals, emphasizing the role of nonverbal responses to environmental factors as a major determinant of behavior. Related to Bitner's (Bitner, 1992) exploration of how physical environments might affect both employees and customers and Donovan and Rossiter's (Donovan and Rossiter, 1982) PAD framework, Figure 1 illustrates how store environments might influence shopping behavior through mediating emotional states. The store environment contains various stimuli that might be perceived by the customer's senses; each stimulus varies along many parameters. For example, store music varies by volume, tempo, pitch, and texture and by the specific songs played (see Bruner [1990] for a lengthy discussion of music as a marketing stimulus). In addition, factors can be combined to create unique atmospheres. A manager might choose classical music, subdued colors, elegant perfumes, cool temperatures, sparsely displayed merchandise, and low lighting to project an upscale image.

Mehrabian and Russell's (Mehrabian and Russell, 1974) framework specifies that individuals react to their environment along three basic dimensions: pleasure, arousal, and dominance (PAD). The first is an affectual reaction, labeled pleasure-displeasure. This entails whether individuals perceive the environment as enjoyable or not enjoyable. For example, playing popular songs should enhance shoppers' enjoyment, whereas unpopular music might diminish it. The second dimension relates to arousal. It assesses how much

the environment stimulates the individual. Milliman (1982) found that playing slow music resulted in slower customer movement through a supermarket relative to no music or fast music; this result is perhaps attributed to a decrease in arousal. Relatedly, Kellaris and Kent (1993) found main effects for music tempo on subject arousal in a laboratory study. The third dimension is dominance, which concerns whether individuals feel dominant (in control) or submissive (under control) in the environment. An early study by Babbitt (1878) reported that violent patients became more violent when placed in a red colored room but less violent when in a blue room. This is consistent with the finding that individuals associate the color red with active, assertive, and rebellious moods (Aaronson, 1970), whereas they associate blue with sedate tranquility and a suppression of feelings (Schaie and Heiss, 1964).

The PAD model has been tested in both retailing and nonretailing environments. Donovan and Rossiter (1982) reported that shopping behaviors were related to measures of pleasure and arousal but not dominance. In nonretailing environments, research generally supports the PAD model with the exception that dominance is sometimes not a major factor or simply not measured (Russell, 1980). It remains unclear whether difficulties in identifying behaviors associated with dominance reflect its small influence on behavior or the need for improved measurement.

The last element of the framework presented in Figure 1 is a taxonomy of possible behavioral reactions to the environment (cf., Donovan and Rossiter, 1982). Although a variety of shopping behaviors can be affected in many ways by environmental factors, Mehrabian and Russell (1974) suggested use of an approach-avoidance paradigm. Thus, environments could be constructed to encourage or discourage approach behaviors. For example, bright colors might encourage individuals to enter a fast food restaurant, whereas uncomfortable seating might discourage long stays. These approach-avoidance behaviors can be grouped into four categories based on the type of behavior: time, exploration, communication, and satisfaction.

Time relates to the desire to physically stay in or to get out of the environment. This relates to the decision to shop or not to shop at the store. It also might relate to the length of time spent in the store. Presumably, attractive in-store

environments build store traffic and encourage individuals to linger in the stores. However, it might be difficult to accomplish both simultaneously. For example, bright yellow might attract customers but prolonged exposure might be overstimulating resulting in a quick departure.

Exploration concerns the desire or willingness to explore the environment. This relates to how much area of the store is covered. Stores are sometimes designed like mazes with areas not easily seen from a single location to encourage shoppers to walk around. Having hidden sale displays might further reward and encourage shoppers to explore the entire store. Dark colors might suggest mystery and entice exploration.

Communication involves the willingness to communicate with others in the environment. This would be particularly important in retail stores in which customers must rely on the sales staff to describe and explain the items in the store. Neutral colors might minimize status differences and thereby encourage greater social interaction.

Satisfaction is the degree of enhancement or hindrance of performance and satisfaction with task performance. This relates to the ability of customers to locate what they want, to purchase the item with a minimal wait in line, and to transport easily the item from the store to their car. Express lines and carryout help facilitate this aspect of grocery shopping.

## Music and Time Perceptions

The current research primarily focuses on how much time consumers choose to spend shopping as a function of the type of music played in the store. Time is an important factor in retailing because retailers strongly believe in a simple correlation between time spent shopping and amount purchased. Academic research suggests that music choices affect actual shopping times. For example, in Milliman's (Milliman, 1982) study, grocery store shoppers were exposed to either fast, slow, or no music while shopping. The results were that consumers spent 38% more time in the store when exposed to slow music compared with fast music. This was partially attributed to a slowing of the shopping pace when the slow music was being played. Although not assessed, it is likely that shoppers spent more time in the store during the slow music periods than the fast music periods. Milliman (1986) observed this effect when he replicated his study in a restaurant setting. Smith and Curnow (1966) reported that shoppers spent less time in a grocery store when listening to loud music compared with softer music.

In addition to directly affecting how much time shoppers spend in a store, music appears to affect shoppers' perceptions of the amount of time they spent shopping. In a field experiment by Yalch and Spangenberg (1988), clothing store shoppers were exposed either to youth-oriented foreground music or adult-oriented background music. Interviews with shoppers as they were exiting the store revealed that younger shoppers felt they had shopped longer when exposed to back-

ground music, whereas older shoppers felt they had shopped longer when exposed to foreground music. Unfortunately, actual shopping times were not observed so it could not be determined if individuals actually shopped longer, merely thought that they did, or a combination of both factors. A similar situation occurred for Gulas and Schewe (1994) who reported that baby boomers reported shopping longer in a grocery store when listening to familiar classic rock compared with unfamiliar big band music.

The limitation of Yalch and Spangenberg (1988) was addressed in a follow-up study (Yalch and Spangenberg, 1993). Here, consumers were exposed to either background or foreground music. Their shopping behavior was both observed and self-reported. The results showed that shoppers reported being more familiar with the foreground music than the background music. Actual shopping time was longer in the less familiar background music condition, but perceived shopping time was longer in the more familiar foreground music condition. Although informative, this study incompletely settles the music-time issue because both were allowed to vary. Thus, it can not be determined whether music only affected time perceptions, which in turn altered actual times or both.

Kellaris and Kent (1992) addressed the time perception-music relationship in a laboratory setting. Subjects were exposed to two and half minutes of music varying in modality (major, minor, or atonal). After this, they evaluated the music and how much time they thought had transpired while the music played. The results showed that subjects perceived the atonal mode music as more dissonant and not in any particular key compared with the minor or atonal music. Furthermore, they perceived the major mode music as lasting longer compared with the minor and atonal mode music. Although the atonal music was liked less than the others, there was no relationship between liking and time perceptions. Kellaris and Kent attributed the longer perceived duration evidence when subjects listened to more familiar music to the possibility that this results in more information being stored about the experience. The greater amount of information may have been used by subjects to infer that more time had passed.

In summary, prior research strongly suggests a relationship between a characteristic of environmental music (how familiar shoppers are with the music being played) and both the actual and perceived amount of time devoted to shopping. The relationship is interesting because there appear to be contrasting effects. Familiar music, relative to unfamiliar music, may cause individuals to spend less time shopping but perceive themselves as spending more time.

## Research Issues

An experiment was conducted to learn how individuals engaged in a shopping activity might be affected by environmental music varying in its perceived familiarity to the shoppers. Fontaine and Schwalm (1979) reported that, relative to no

music or unfamiliar music, playing familiar music increased subjects' arousal level, vigilance in detecting visual signals, and mitigated an expected decline in vigilance as the length of the session increased. Thus, it is expected that individuals listening to familiar music will be more aroused and spend less time shopping than individuals listening to unfamiliar music (much as Milliman's subjects shopped faster when listening to faster tempo music). This prediction is consistent with Yalch and Spangenberg (1993) and was tested in the current study by observing the length of time individuals shopped when given a choice as to how much time to spend shopping.

A second issue concerns the relationship between music and perceived time. Perceptions of greater duration appear to be associated with awareness of the environment and activities occurring in it (Zakay, Nitzan, and Glicksohn, 1983). Because listening to familiar music seems to cause individuals to be more vigilant compared with listening to unfamiliar music (Fontaine and Schwalm, 1979), shoppers were expected to perceive more time passing. Thus, it was expected that for shoppers who had a fixed amount of time to shop, individuals would estimate that more time transpired when listening to familiar music compared with unfamiliar music (cf., Yalch and Spangenberg, 1988, 1993; Kellaris and Kent, 1992).

A third issue concerns the effect of music on product evaluations. Because individuals were expected to feel more comfortable in an environment featuring familiar atmospheric elements than unfamiliar ones, their product evaluations were expected to be more favorable when familiar music was played compared with unfamiliar music.

The final research issues pertain to the mediating role of the emotional measures of pleasure, arousal, and dominance. Individuals were expected to evidence more arousal, more pleasure, and a greater sense of dominance when listening to familiar music than unfamiliar music. These emotional responses, in turn, were expected to account for some of the effects of music on perceived and actual shopping times and product evaluations.

## Method

### Overview

A  $2 \times 2$  factorial experiment was conducted to determine how time spent shopping might be affected by the type of music being played in the environment. One factor that varied was the music being played while respondents shopped. Half heard familiar "contemporary" music, and the other half heard unfamiliar "easy listening" music. The other factor was control over the time spent shopping. Half the subjects were given a fixed amount of time to shop whereas the other half could shop as long as they wanted. Shopping time was controlled in order to separate perceptual effects from actual effects. This necessitated using a simulated shopping experience instead of naturally occurring shopping. Dependent measures in-

cluded the amount of time actually spent shopping, the amount of time perceived to have been spent, and product evaluations. In addition, respondents completed a modified version of Donovan and Rossiter's (Donovan and Rossiter, 1982) measures of emotional responses to environmental stimuli.

### Design

Seventy-one individuals were recruited from marketing classes to participate in a new product evaluation task. In groups of three to six, subjects entered a classroom set up to appear like a clothing store. Ten articles of outdoor outerwear and equipment were displayed on tables, and one of the two types of music was provided by a concealed tape recorder. Each subject completed a questionnaire while examining three items they chose from those on display. Half of the subjects were given a fixed amount of time to complete the task. The other half had an unlimited amount of time.

### Manipulations

**MUSIC FAMILIARITY.** Two tapes were provided by a national supplier of environmental music. One tape consisted of familiar music, mostly top 40 songs designed to appeal to college-aged individuals. The other tape was unfamiliar (to our subjects) music, older songs played in an instrumental form. Although songs on the unfamiliar music tape were less well known to subjects, it was still likely that they would find it enjoyable as this music was designed by the providing firm to appeal to a broad cross-section of the population. Thus, it was expected that subjects would express little or no difference in liking for the two types of music; only differences in familiarity should be found.

**TIME CONTROL.** The other manipulation in the experiment involved control over the amount of time available to complete the product evaluation task. Half of the subjects were given the opportunity to take as much time as they wanted. The other half were given exactly 11 minutes for the task; pretests determined that this was a reasonable amount of time to examine the merchandise. The purpose of this manipulation was to distinguish actual and perceptual time effects. If subjects spent more time when listening to familiar music, this would be evident in the variable time condition. Efforts to isolate a perceptual effect without controlling time would be hindered by the possibility that perceptual differences are related to duration. For example, individuals may misestimate time more as its duration increases. With this study's design, music's separate effect on perceptions could be observed in the fixed time condition.

### Measures

The key dependent measures were product evaluations, emotional state (PAD), perceived shopping times, and actual shopping times. Product evaluations were assessed by seven bipolar

adjective scales consisting of items like lowest performance/highest performance and not at all stylish/very stylish. Emotional state was measured by 17 bipolar adjective scales adaptive from Donovan and Russell's (Donovan and Rossiter, 1982). These included relaxed/stimulated, annoyed/pleased, free/restricted, and wide awake/sleepy. Perceived shopping time was measured with a horizontal line with markings at various time intervals.

### Procedure

Upon entering the simulated shopping area, subjects received a shopping booklet that included an eight-page questionnaire. After reading a cover sheet describing the task as an evaluation of several proposed new types of outdoor equipment and clothing from a local manufacturer, subjects answered two pages of background questions related to subjects' experience and interest in outdoor activities. This was largely used to disguise the study as concerning outdoor products. The next three pages were identical and provided evaluation questions for three of the items on display. Subjects were instructed to assume that they were shopping for outdoor equipment and to select items of interest. The subjects wrote the name of the item at the top and evaluated it on seven bipolar adjective scales. In addition, subjects indicated their likelihood of buying the item, what they thought was an appropriate price, and the maximum price they would pay. Finally, they were provided with several blank lines and encouraged to write down any other thoughts that they might have. This was intended to encourage additional scrutiny of the items and provide an opportunity for shoppers to expand or shorten the task.

Subjects informed the experimenter when they had completed their shopping experience. At this point, they estimated the amount of time they had spent doing their product evaluations by marking an "X" on a dashed line with 60 dashes and points marked at 0, 5, 10, 15, and 20 minutes. The next to last page of the questionnaire consisted of a series of bipolar adjectives assessing the emotional responses (PAD) of the subjects to the simulated retail environment. The last page had several scales to determine the subjects' reactions to the room (sense of being crowded or not, temperature, lighting) and the music (liked/disliked and usually listened to/rarely listened to). These scales were used to test the construct validity of the music manipulation. Debriefing occurred after all groups had participated.

## Results

### Music Manipulation

The subjects' evaluations of the familiar and unfamiliar music at the end of the questionnaire were used to test whether their perceptions corresponded to the experimenters' expectations. The  $t$ -tests revealed no difference in liking of the music (familiar = 3.9, unfamiliar = 4.0,  $t(69) < 1.0$ ) but a significant

difference in familiarity (familiar = 3.9, unfamiliar = 1.9,  $t(69) = 4.5$ ,  $p < 0.001$ ). Thus, our expectation that liking would not differ between the two types of music was supported, and the familiarity manipulation was successful.

### Other Environmental Factors

Evaluations of the retail setting in terms of lighting and temperature revealed no differences between the music conditions ( $t < 1$ ).

### Effects of Music on Time

The effects of music on actual and perceived shopping times were assessed in several ways (see Table 1 for cell means). First, variation in actual time was examined by comparing subjects in the variable time conditions who were exposed to familiar and unfamiliar music. Less time was spent when the familiar music was being played, ( $t[37] = 1.7$ ,  $p < 0.1$ ). Although only marginally significant, this is consistent with our prediction that familiar music would lessen time spent at an activity.

To test music's effects on perceived time, a comparison was made between unfamiliar and familiar music groups when shopping time was restricted to 11 minutes. The results were as expected (Table 1). Subjects perceived themselves as spending longer when exposed to the more familiar music compared with the less familiar music ( $t[28] = 2.02$ ,  $p < 0.05$ ).

Finally, the effect of music on perceived shopping time was analyzed in the variable time condition (Table 1). There was no difference in the perceptions of how much time was spent shopping between the two music conditions ( $t[37] < 1$ ). Thus, although consumers shopped less when listening to familiar music, they perceived themselves as shopping longer. Regressing actual time, the type of music being played and their interaction on perceived time revealed a significant main effect of the music condition ( $t = 2.1$ ,  $df = 66$ ,  $p < 0.05$ ) and marginally significant interaction ( $t = 1.8$ ,  $df = 66$ ,  $p < 0.08$ ). The main effect of the actual amount of time on perceived time was insignificant. These results show that consumers who listen to familiar music may report shopping longer, but this is more a perceptual distortion (significant effect of music) than actual behavior differences (insignificant effect of actual time).

### Effects of Music on Emotional Responses

Responses to the seventeen bipolar adjective scales adaptive from Donovan and Russell's (Donovan and Rossiter, 1982) scales were factor analyzed, resulting in three clearly identifiable factors. The pleasure dimension consisted of contented-depressed, happy-unhappy, satisfied-unsatisfied, annoyed-pleased, bored-interested, hopeful-despairing. Responses to these items were summed and considered a measure of positive and negative mood during the task (Cronbach's  $\alpha = 0.88$ ). The second factor was labeled arousal and was composed of the items relaxed-stimulated, calm-excited, aroused-un-

**Table 1.** Cell Means for Time, Emotions, and Product Evaluations

	Variable Shopping Time		Fixed Shopping Time	
	Unfamiliar Music	Familiar Music	Unfamiliar Music	Familiar Music
Actual time (seconds)	801	738	660	660
Perceived time (seconds)	483	527	436	607
Pleasure	28.5	29.6	30.6	24.6
Arousal	13.1	15.5	16.0	14.4
Dominance	13.2	12.7	14.8	11.7
Product evaluations <sup>a</sup>	37.1	37.8	37.1	39.6

<sup>a</sup> Not adjusted for emotional states used as covariates.

aroused, and frenzied-sluggish, (Cronbach's  $\alpha = 0.70$ ). The third dimension was dominance and included responses to three items, controlled-in control, dominant-submissive, and influenced-influential (Cronbach's  $\alpha = 0.52$ ).

Differences in emotional responses due to the type of music and variations in the amount of time allowed for shopping are reported in Table 1. Analysis of variance indicated a significant interaction of time control and music familiarity on the pleasure dimension ( $F [1, 65] = 5.4, p < 0.03$ ). Analyses were run separately for the fixed and variable time groups, revealing a significant effect of music only in the fixed time condition. Contrary to expectations, individuals reported greater pleasure when listening to unfamiliar music compared with familiar music ( $t[28] = 2.2, p < 0.05$ ).

There was also a significant interaction effect between music familiarity and control of time ( $F [1, 65] = 4.2, p < 0.05$ ) for the arousal measure. Separate analyses for the two time conditions revealed no effect of music in the fixed time condition. In the variable time condition, individuals reported greater arousal when listening to the familiar music compared with unfamiliar music (mean<sub>familiar</sub> = 15.5, mean<sub>unfamiliar</sub> = 13.0,  $t[37] = 1.9, p < 0.07$ ).

For the dominance measures, although there was a significant overall effect of music ( $F [1, 64] = 4.8, p < 0.05$ ), separate analysis by control of time revealed that the effect was significant only in the fixed time condition. Here, individuals reported greater sense of dominance when listening to the unfamiliar music compared with the familiar music ( $t[29] = 3.0, p < 0.01$ ).

### Mediating Role of Emotions on Shopping Times

The mediating effect of the emotional responses on actual and perceived shopping times was tested using analysis of covariance. The statistical procedure used the three emotional states as covariates and type of music as the treatment factor. For subjects in the variable time condition, the results were that actual time increased with arousal ( $F [1, 33] = 6.6, p < 0.05$ ) and that once this effect had been considered the effect of music was no longer significant ( $p > 0.3$ ). For subjects in

the controlled time condition, perceived shopping time was not significantly related to any of the covariates.

### Mediating Role of Emotions on Product Evaluations

Although subjects could evaluate three products, some subjects in the fixed time condition did not have enough time to complete their evaluation of the third product, and some in the variable time condition chose not to evaluate a third product. Therefore, only responses to the seven bipolar adjective scales for the first two products were summed and averaged to develop a measure of overall product evaluations. The effects of type of music and control of time on these evaluations was tested using analysis of covariance with pleasure, arousal, and dominance as the covariates for both the fixed and variable time conditions. Because there was a significant interaction between type of music and control of time ( $F [1, 53] = 4.6, p < 0.05$ ), separate analyses were conducted for the fixed and variable time conditions. For the fixed time condition, the results were that product evaluations were affected by pleasure, ( $F [1, 53] = 5.5, p < 0.05$ ) and music ( $F [1, 18] = 5.7, p < 0.05$ ). Shoppers evaluated the two products more favorably when in a high pleasure state than a low pleasure state and when listening to familiar music compared with unfamiliar music. In the variable time condition, only arousal ( $F [1, 32] = 5.2, p < 0.05$ ) was significantly related to product evaluations. Correlational analysis across all groups revealed that product evaluations were positively related to pleasure ( $r = 0.33$ ) but negatively related to arousal ( $r = -0.25$ ). Music had no significant effect on product evaluations in the variable time condition.

### Discussion

The results of this study support the belief that shopping time is affected by a retail environmental factor like store music. Individuals who had a choice as to the duration of their shopping experience shopped longer when listening to less familiar music compared with more familiar music. This differ-

ence appeared attributable to differences in emotional responses to the two types of music. Individuals reported being less aroused while listening to the unfamiliar music compared with the familiar music. Once the effect of arousal on shopping times was considered, other reactions to music familiarity (either measured or unmeasured) did not have an effect on actual shopping times.

The effects of familiar and unfamiliar music were very different when perceived rather than actual shopping times were considered. When total shopping time was controlled, individuals reported shopping for a longer time when they had been exposed to the less familiar background music compared with the familiar foreground music. This effect was not mediated by the emotional response measures, suggesting that it might reflect cognitive rather than emotional reactions.

Kellaris and Kent (1992) discussed three theories related to how music might influence time perceptions by affecting the storage and retrieval of activities occurring in a given time period. Each appears to be a plausible explanation of the observed effects of familiar music. For example, Ornstein (1969) offers the idea that a time period appears longer when one can remember more about it. It is likely that individuals can remember familiar music better than unfamiliar music. Fraisse (1984) noted the possibility that time duration is related to noticing more changes. It is possible that shoppers more often notice the beginning and ending of familiar songs compared with unfamiliar songs. Zakay (1989) presents the idea that an increasing number of distractions reduces what one remembers from a time period. If individuals devote more attention to unfamiliar music than familiar music (perhaps trying to identify it), they are less likely to remember their activities. It would be desirable for future research on environmental music to focus on these cognitive factors as well the emotional aspects.

The results of this research revealed that environmental music affected product evaluations in a less clear way than shopping times. In the fixed time condition, products were evaluated higher when subjects were exposed to familiar compared with unfamiliar music. However, when time was not controlled, music had no effect on product evaluations. Although product evaluations were positively related to the pleasure measures and negatively related to arousal, these emotional relationships could not be related to the music manipulations. For example, in the fixed time condition, subjects reported higher product evaluations but lower pleasure ratings when listening to familiar music. These findings demonstrate the complex aspect of researching music.

This complex relationship between music and shopping times demonstrates the practical difficulty of using environmental factors to affect consumer behavior. An environmental factor may have a predictable and desirable effect on one aspect of shopping, but there is the possibility that it will affect other aspects in unpredictable or undesirable ways (see Turley and Milliman, this issue for many examples). The net

result in many cases may be that the desired behavioral change does not occur. Retailers are therefore cautioned to evaluate their atmospheric design choices on all relevant dimensions before implementing them.

Efforts to relate music to emotional states also may be affected by compensating factors. For example, all three emotional states (pleasure, arousal and dominance) were affected by the interaction of music with control of the amount of time shopped. In the fixed time conditions, listening to unfamiliar music increased perceptions of pleasure and dominance but not arousal. In the variable time condition, familiar music enhanced arousal but not pleasure and dominance. A possible explanation is that in the variable time condition, pleasure and dominance may have been enhanced by the unfamiliar music and individuals responded by continuing their shopping (actual shopping was longer in this condition). After the extended time period, emotional states may have reverted back to normal levels such that by the time emotional states were assessed they were equivalent to those in the familiar music condition. If so, this implies that retailers should not rely on post-shopping (exit) questionnaires to evaluate emotional states. Instead, interviewing should be done while shoppers are still examining the merchandise.

Although studies have reported significant correlations between measures of retail environments, emotional states, and shopping experiences (e.g., Donovan and Rossiter, 1982; Dawson, Bloch, and Ridgway, 1990; Sherman, Mathur, and Smith, 1997), the experimental research reported in this article found the postulated relationships to be tenuous. Overall, product evaluations were positively related to pleasure. This is consistent with the idea that consumers will be more favorably disposed toward products when they are in a good mood (Gardner, 1985). Furthermore, product evaluations were negatively related to arousal. This is consistent with the idea that aroused shoppers may be more vigilant and discriminating when examining products. However, neither emotional measure used in the present research accounted for the effects of familiar music on product evaluations. For shoppers in the fixed time condition, familiar music enhanced evaluations relative to unfamiliar music. This occurred even though pleasure was lower and arousal greater when individuals were exposed to familiar music in the fixed time condition. Clearly, more research is needed to identify other factors besides the emotional states postulated by Mehrabian and Russell (1974) that might cause music to affect product evaluations. One possibility is through classic conditioning in such a way that individuals are not aware of emotional state changes (cf., Gorn, 1982).

Another issue highlights the difficulty of interpreting experimental effects of music on shoppers: Kellaris and Kent (1993) warned that, "When different pieces of music are used to manipulate a musical variable, musical properties will be confounded, making it difficult to isolate specific causal antecedents" (p. 395). Nearly all retail studies involving music have used different selections for different experimental conditions.

Although manipulation checks revealed that the environmental music used in this research with these subjects differed only in familiarity and not liking, there may have been differences not captured by the manipulation check measures that suggest that caution be used in interpreting the results. The familiar music used a foreground type sound often found in restaurants and specialty clothing stores. On the other hand, the unfamiliar music used a background type sound associated with offices and large department stores. Thus, it is possible that cognitive associations with the music may have affected the product evaluations.

Retail managers believe and observations confirm that consumers tend to buy more when they shop for a longer time. If managers seek to influence shopping times by creating a familiar atmosphere, the results of this study show that they may not get the intended effect. Although individuals reported shopping longer when listening to familiar music, they actually shopped longer when listening to unfamiliar music. This finding highlights the importance of using observed as opposed to reported shopping behaviors when evaluating atmospheric factors. In the present study, there was only a small correlation between actual and perceived shopping times ( $r = 0.2$ ). Managers also are encouraged to consider other aspects such as liking of music (a common factor in advertising experiments on music; e.g., Gorn, 1982), tempo (e.g., Milliman, 1982), volume (Kellaris and Altsech, 1992), and the interaction between music and characteristics of individual listeners (Kellaris and Kent, 1993).

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