The Interaction of Retail Density and Music Tempo: Effects on Shopper Responses

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ABSTRACT

Research examining the effects of store environment on shoppers has found that a number of atmospheric cues have significant effects on shoppers' cognitive, affective, and behavioral responses. To date, retail atmospheric cues have been studied in isolation, instead of simultaneously, like they occur in the retail setting. This study examines the interactive effects of two atmospheric cues—retail density and music tempo—and their impact on shopper responses within a real shopping environment. Based on the schema incongruity model, it is found that shopper hedonic and utilitarian evaluations of the shopping experience are highest under conditions of slow music/high density and fast music/low density. Significant main effects of music tempo are found for behavioral responses such as approach/avoidance tendency and extent of browsing behavior. The results underscore the need to examine interactive effects of atmospheric cues to better understand the impact of the store environment on shoppers. © 2005 Wiley Periodicals, Inc.

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Retail practitioners have long operated on the assumption that store atmosphere affects shopper behaviors and shopping outcomes. The increasing research evidence in the area also confirms this belief by demonstrating the significant influence of atmospheric factors in various commercial settings such as restaurants (Caldwell & Hibbert, 2002; Milliman, 1986), banks (Dube & Chebat, 1995), supermarkets (Harrell, Hutt, & Anderson, 1980; Milliman, 1982), and malls (Downs, 1970; Eroglu & Harrell, 1986; Oppewal & Timmermans, 1999; Shim & Eastlick, 1998; Wakefield & Baker, 1998). Among the numerous aspects of the retail environment examined, two factors, music and crowding due to high density, have been shown to be particularly critical in influencing customer responses in both positive and negative ways (see, for example, Eroglu & Machleit, 1990; Hui & Bateson, 1991; Kellaris, Cox, & Cox, 1993; Machleit, Eroglu, & Mantel, 2000; Machleit, Kellaris, & Eroglu, 1994).

Shoppers perceive retail crowding when density (the number of people and objects in a limited space) restricts or interferes with their activities and shopping goals (Eroglu & Machleit, 1990). When the retail environment is judged to be dysfunctionally dense, shoppers are likely to experience crowding, which then affects their attitudes toward the store and the shopping environment (Betts & McGoldrick, 1996; Eroglu & Machleit, 1990; Johnson-Hillery & Kang, 1997; Machleit et al., 2000). If and how much retail crowding influences shopping behaviors, however, has yet to be determined. Research to date has examined cognitive and emotional outcomes of retail density, but, perhaps due to data collection difficulties, has not focused on behavioral outcomes. Hui and Bateson (1991) came close by examining approach/avoidance desires in a service setting as dependent variables in a path model. They demonstrated an indirect effect of density on perceived crowding, which then influenced pleasure and ultimately approach/avoidance intentions. Yet research is needed to examine the effects of density on behavioral responses in the actual shopping environment.

Similarly, music as an atmospheric variable has been found to influence various in-store shopping attitudes and behaviors, including moods and unplanned purchases (Alpert & Alpert, 1990; Yalch & Spangenberg, 1990), time spent in the environment (Milliman, 1982; 1986) and perceived waiting time (Chebat, Gelinas-Chebat, & Filiatrault, 1993). Clearly, research on crowding and music is relevant to retailers given the demonstrated influence these stimuli have on shopper purchases and patronage behaviors.

Although there is ample empirical evidence to support the in-store effects of these two atmospheric factors individually, no study to date has examined their *interactive* impact in a single study. There are reasons to suspect a joint effect between these two factors. The information-overload theory of crowding defines it as a high-density condition when the rate and amount of environmental stimuli exceed the capacity to cope with them (Milgram, 1970; Saegert, 1973). Given that in-store music is yet another stimulus to add to the already dense environment, it is log-

ical to expect an interaction between density and music in the retail setting. Similarly, in the marketing literature, Bitner (1992) has identified music as one of the ambient cues and crowding as one of the spatial/function cues, and called for studies to examine these and other environmental factors in tandem.

The purpose of this study is to examine the simultaneous effect of in-store density and music on shopping behaviors and evaluations. Specifically, it is proposed that the interactive effect of retail density and background music tempo will have a significant influence on customers' cognitive and behavioral shopping outcomes, such as their evaluations of the hedonic and utilitarian value of the shopping experience, and amount of money spent in the retail setting.

CONCEPTUAL BACKGROUND

Two Retail Atmospheric Cues: Density and Music

Density is the root cause of the crowding experience (Eroglu & Machleit, 1990; Rapoport, 1976). In the retail context, when a shopper perceives the environment as dysfunctionally dense, he or she will perceive the environment to be confining and constraining, which leads to the state of crowding. In other words, highly dense conditions will result in perceptions of crowding, which then sensitize the individual to actual or potential problems resulting from limited space (Stokols, 1972). In the retail context, dense, crowded environments may induce tension and confusion, leading to less favorable evaluations of the shopping experience (Eroglu & Harrell, 1986; Harrell et al., 1980). High levels of perceived retail crowding are found to reduce customers' satisfaction with the shopping experience and the store, depending on their prior expectations and tolerance for density (Machleit et al., 2000).

The impact of music in commercial domains is also examined in stores and offices (Kotler, 1973/1974), advertisements (Hahn & Hwang, 1999; Sullivan, 1990), and films (Seidman, 1981). The background music in retail establishments is found to affect various shopping behaviors and evaluations such as the pace of in-store traffic flow and dollar sales volume (Milliman, 1982), drinking time (McElrea & Standing, 1992), perceived and actual time spent shopping (Yalch & Spangenberg, 2000), and desire to interact with salespeople (Dube, Chebat, & Morin, 1995). In the consumer-research domain, music is shown to influence hedonic consumption and consumer aesthetics (Holbrook & Anand, 1990; Kellaris & Rice, 1993), mood (Alpert & Alpert, 1990), nostalgia (Holbrook & Schindler, 1991), attitude formation (Park & Young, 1986), and classical conditioning (Kellaris & Cox, 1989).

Undeniably, both density and music are commercially significant retail atmospheric factors that are of interest to marketing researchers. Given

this significance, the combined effect of these two variables should have practical and theoretical implications. A number of questions can be posed: To what extent can the impact of one of these factors be mitigated or offset by the other? For example, to what extent can the negative effects of high density on shoppers be reduced by slow-tempo, soothing music? How do these two stimuli influence customers' hedonic and utilitarian shopping values (Babin, Darden, & Griffin, 1994)? Clearly, the interactive impact of retail density and music is likely to produce some cognitive and behavioral responses in the shoppers. This discussion now turns to each of these response sets.

Cognitive Responses to Retail Density and Music

One potential conceptual framework that might help address the nonbehavioral responses to external stimuli is information processing and schema incongruity theory. The basic argument of the schema incongruity theory is that when faced with stimuli that are mildly incongruent with prior expectations, individuals will engage in more elaborative information processing (for a review, see Heckler & Childers, 1992). Along these lines, Mandler (1982) suggests that the very process of responding to (in)congruity may itself produce some affect or arousal that might contribute to individuals' evaluations. More specifically, he argues that people respond more affectively to moderate incongruity than they do to extreme incongruity. This is because, under the mildly incongruent situation, the novelty element increases arousal, thus leading to favorable evaluations of the situation, object, or person. For example, suppose a shopper is put in a high-density mall where she experiences high levels of retail crowding. Yet, throughout her efforts to cope with the dense situation, she is also exposed to slow-tempo background music—an ambient condition that is at odds with the mad rush around her. This incongruity with the shopper's expectations would be considered moderate if it could be resolved in her mind without requiring a major change in her existing cognitive structure. She could reason, for instance, via subtyping that "Although this is just another crowded mall, it has a different atmosphere. I don't feel as rushed here." Alternatively, extreme incongruity is defined as the case where the shopper cannot resolve or reason about the situation without making some fundamental changes in her existing cognitive structure, such as redefining her basic "mall" schema. Such a major mental effort, then, is likely to result in more negative evaluations (about the mall or shopping experience, for example) than would the evaluations resulting from moderate incongruities.

Consistent with the above discussion, it is expected that a moderate incongruity situation will arise from the interplay between different levels of density and tempo of music in the retail setting. Furthermore, it is expected that shoppers who are experiencing this situation are likely to make more favorable evaluations of their shopping trips than they would in the extremely congruent or incongruent scenarios. Such shop-

ping evaluations can come in the form of both hedonic and utilitarian assessments (Babin et al., 1994). Hedonic value reflects the entertainment and emotional worth of the specific shopping trip, while utilitarian value assessments reflect whether the shopping tasks were accomplished. Taken together, these two types of evaluations provide an encompassing assessment of the overall character of the shopping trip.

Based on the above, it is hypothesized that:

> In the moderately incongruent conditions of high (low) density and slow- (fast-) tempo music, hedonic and utilitarian evaluations of the shopping experience will be more favorable than in the congruent conditions of high (low) density and fast (slow) music.

Behavioral Responses to Retail Density and Music

Although the schema incongruity theory is useful for explaining cognitive responses to external stimuli such as in-store density and music, it does not make any predictions regarding behavioral responses. However, previous studies in crowding and music effects suggest that these two stimuli may create some behavioral consequences. For example, fast-tempo background music, as opposed to slow tempo, in supermarkets has not only increased the pace of the store traffic flow but also the daily gross sales volume purchased by consumers (Milliman, 1982). Similarly, slow (vs. fast) tempo music was found to decrease restaurant patrons' dining speed, waiting time, and amount spent (Milliman, 1986). Oakes (2003) found that music tempo affected perceived waiting time in a registration line, and that slow-tempo music increased positive affective responses. Consistent with these results, McElrea & Standing (1992) showed that slow music significantly decreased speed of drinking, and in a study by Dube et al. (1995) music was found to induce arousal and pleasure among bank customers, which then affected their desire to affiliate with the bank employees.

In contrast to this literature, studies on crowding effects have neglected the behavioral consequences of high-density conditions in commercial domains and focused on cognitive and emotional responses. For example, high-density conditions have been shown to lead to low shopping satisfaction (Machleit et al., 2000), less desire to stay, explore, and affiliate (Hui & Bateson, 1991), lower repatronage intentions (Eroglu & Machleit, 1990), and satisfaction with purchased items (Harrell et al., 1980). To date, there are no studies that directly examine the impact of retail density on shopper behaviors, although the previous findings in the area suggest a potential relationship.

Based on the above discussion, it is likely that music tempo and density will affect behaviors; thus the interactive effect of these two atmosphere characteristics on various shopper behaviors is explored. *Hence, whether music tempo and shopper density will have main or interactive effects is tested as an empirical question.*

METHOD

Sample and Data Collection

There were 347 respondents participating in the study. The age of the respondents ranged from 23 to 54 with the majority (29.2%) of the shoppers in the 35–44 age group; 59% of the sample was female.

Data were collected in two waves via the intercept method at a suburban mall in a large metropolitan city during a time period when there were no mall promotions or holiday specials. The interviewers intercepted shoppers on a random basis in the main lobby of the mall. The respondents were seated at a table to complete a self-administered questionnaire that took approximately 15 minutes to finish.

Density was determined by recording the time of the day that the interview took place and by categorizing it into high- and low-density time periods. The most appropriate measure for human density is, inarguably, the number of individuals in a given space during a specific time period. However, counting the number of individuals within a large space (the mall) with numerous entrances and exits was not feasible. Although the mall-intercept method allowed for unobtrusive manipulation of the music tempo and for increased realism in the experimental setting, it simply did not allow for an accurate head count for density calibrations. In assessing a surrogate measure for human density, a pretest at the same mall found significant differences in human density perceptions of shoppers at various times of day/week ($F(2, 519) = 4.59; p < .01$). Hence the time of day/week was used as the necessary surrogate measure for density, and the interviews were accordingly separated into high- and low-density groups.

The musical pieces were calibrated by an expert of Muzak. The music tempo was either fast (96 BPM) or slow (60 BPM). The genre (classified as "familiar adult contemporary favorites") and volume of the music played were same for both the fast and slow conditions.

MEASURES

Hedonic and utilitarian evaluations were measured with Likert-format items from the Babin et al. (1994) scale. Hedonic evaluations included the items "This shopping trip was truly a joy," "This shopping trip truly felt like an escape," "Compared to other things I could have done, the time spent shopping was truly enjoyable," "I enjoyed being immersed in exciting new products," and "While shopping, I felt a sense of adventure" (coefficient alpha = .75). Utilitarian evaluations were measured with the items: "I accomplished just what I wanted to on this shopping trip," "I couldn't buy what I really needed," "While shopping, I found just the item(s) I was looking for." Coefficient alpha was low for the three items

(.55), and was likely due to the subtle reverse coding of the second item. This item was removed and the correlation between the remaining two was .67.

Also on the questionnaire, respondents were asked to approximate the total dollar amount of their purchases for that shopping trip. Respondents also completed a set of yes/no behavioral questions that included "I talked with other shoppers met today in the mall," "I browsed in a mall store without planning to buy," "I bought a snack in the mall," "I shopped in a mall store to buy something today," and "I made unplanned purchases." In addition, respondents indicated their level of agreement with the following behavioral intention statements: "I would avoid returning to this shopping center," "This shopping center is a place where I might try to avoid talking to a salesperson," and "This is a kind of place where I would spend more money than expected."

Hypothesis Test and Exploratory Analysis

An interactive effect of music tempo and density on hedonic and utilitarian evaluations was hypothesized. MANOVA results indicate nonsignificant main effects for music tempo ($p = .804$) and density ($p = .578$), and a significant interactive effect ($p = .005$). The univariate ANOVA interaction for hedonic evaluation was significant ($F = 7.793$, $p = .006$) and the plot of the means is shown in Figure 1. Notice that, as hypothesized, the highest means occur for the moderately incongruent conditions of fast music, high density and slow music, low density. A similar result was observed for utilitarian evaluations; the interaction was significant ($F = 6.727$, $p = .010$; see Figure 2) and the highest means occur for the moderately incongruent conditions. Thus, the hypothesized interaction between music tempo and density was supported by the data.

Next, on a more exploratory basis, music tempo and density effects on various behaviors and behavioral intentions were examined. Respondents had reported the total dollar amount spent at the mall during that shopping trip. ANOVA results indicate a significant main effect for density ($p = .000$), a nonsignificant music tempo effect ($p = .149$) and a nonsignificant interactive effect ($p = .240$). The shoppers spent, on average, \$65.41 during the dense times and only \$34.12, on average, in the low-density times. Although the interaction is not significant, the highest average dollar amount spent is in the dense, slow-music condition (\$75.04) and the next highest dollar average was in the dense, faster-music condition (\$55.77). The average dollar amounts were much lower for the low-density conditions: \$33.13 for the low-density, faster-music condition, and \$35.12 for the low-density, slower-music condition. Interestingly, it was found that there were significantly more "task-oriented" shoppers (those who responded "yes" to "I shopped in a mall store to buy something today") in the dense times versus the low-density times ($\chi^2 = 3.78$, $p = .05$). Given that task-oriented shoppers are interested in pur-

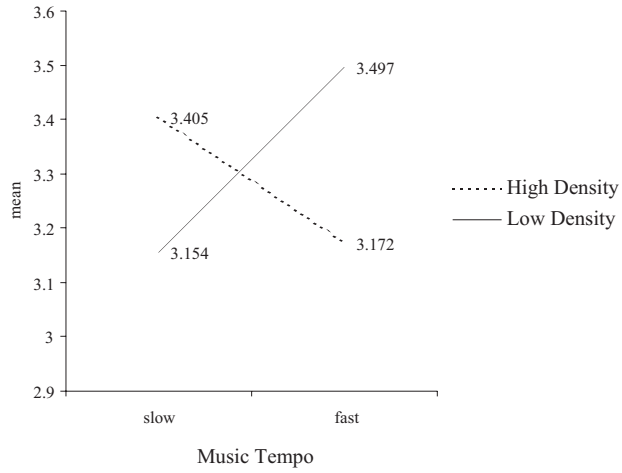

Figure 1. Density × tempo interaction for hedonic evaluation.

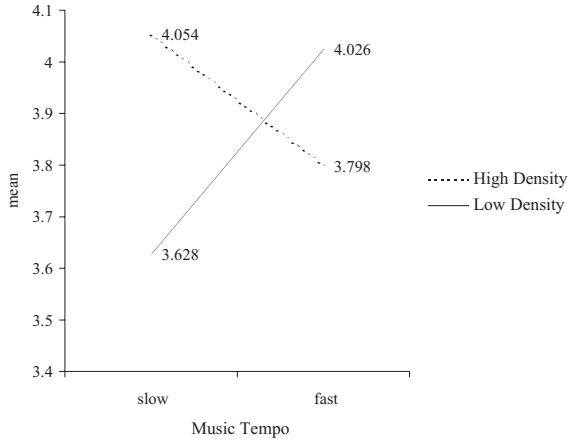

Figure 2. Density × tempo interaction for utilitarian evaluation.

suing their purchase motives, unlike the nontask, recreational shoppers (Bellenger & Korgaonkar, 1980), this finding is not surprising. These results are also consistent with previous findings that it is the spatial, not human, crowding that affects shoppers negatively (Machleit et al., 2000).

To examine additional behaviors, logistic regressions were run with the yes/no behaviors as the dependent variables and music tempo, density, and an interaction term as independent variables. There were no significant interactive effects for any of the four behaviors. For "I talked with other shoppers met in the mall today," there was a main effect of music tempo ($p = .000$) such that more people responded "yes" to this question in the slower music condition (42.0%) than in the faster music condition (19.4%). For "I browsed in a mall store without planning to

buy," there was again a main effect of music tempo ($p = .001$); 51.6% of respondents exhibited this recreational behavior in the slower music condition and only 35.7% of respondents browsed in the faster music condition. Shoppers were also more likely to buy a snack at the mall ($p = .030$) for the slow-music condition (36.1%) than the fast-music condition (24.3%). Finally, there was no music-tempo effect for "I made unplanned purchases" ($p = .205$); however, there was a significant density effect ($p = .048$). More unplanned purchases were made in the high-density condition (43.8%) than the low-density condition (33.1%).

Finally, the future approach/avoidance disposition of the respondent was measured on a 1–7 agreement scale ("I would avoid returning to this shopping center"). ANOVA results demonstrated no interactive effects; there was a main effect of music tempo only ($p = .011$) such that more people would avoid shopping at the center in the fast-music condition ($\mu_{\text{faster music}} = 2.30$, $\mu_{\text{slower music}} = 1.74$).

DISCUSSION

Two qualities distinguish this research from prior work in this area. First, because the study was conducted in an actual mall with naturally occurring shopping behavior, the external validity of the findings surpasses what has been seen in the literature to date. The second contribution of the study is that it takes the work on atmospheric effects in retail environments in a new direction. Although the literature in the area has heretofore focused on the influence of individual atmospheric variables, this research examines the *interactive* effects of two important factors: retail density and music. The findings show that, consistent with the schema incongruity theory, shoppers' hedonic and utilitarian evaluations of the shopping experience are highest under conditions of slow music/high density and fast music/low density. Furthermore, significant main effects of music tempo were found for behavioral responses such as future approach/avoidance tendency toward the store and extent of browsing behavior.

The study has several limitations that should be addressed in future research. First, researchers may be able to develop an improved measure for retail density. Although the time of day/week proved to be an adequate surrogate for density in the present study, researchers may be able to develop more creative methods of measuring customer density in the store. An additional limitation is that there was no measure of perceived crowding taken in the study. Because crowding perceptions are a function of density, yet are individual in nature, it is likely that the interactive effects would have been stronger if perceived crowding, rather than density, was used as the independent variable. Because the density measure is likely to contain more "noise," and because not everyone perceives a dense condition as crowded, the behavioral effects that are observed

might not be as strong as they could be if perceived crowding is the measure employed. However, it is noted that significant interactive effects were observed even when using the more "noisy" density assessment, thus suggesting that interactive effects of crowding and music are worthy of further research.

Finally, although the study benefits from the realism gained by collecting data in an actual mall as opposed to a simulated one, a number of "contaminators" from uncontrollable forces are unavoidable. For example, it is difficult to control and account for variations in the "spatial" density dimension of crowding, as that would require collaboration from all the shops in the mall. For future research, it would be interesting to replicate the study in a controlled environment where both human and spatial dimensions of retail crowding are manipulated. One must note, however, that to obtain realistic assessments of the hedonic and utilitarian value of a shopping trip, one must employ a field study. Assessments of the shopping value of a hypothetical or imagined shopping trip taken in the laboratory would be suspect—it is unreasonable to ask a subject to assess the degree to which the shopping task was accomplished (utilitarian shopping value) in a contrived context. Thus, although there are limitations to the field study, it does maintain the reality of having true shopping episodes with realistic assessments of the key dependent variables.

The findings indicate that at least one quality of music, tempo, together with shopper density, can affect shoppers' cognitive and behavioral responses to the retail environment. A number of research avenues emerge for future study. Certainly other equally important characteristics of music can be considered, such as volume, familiarity, style, key, and so forth. Kellaris et al. (1993), for example, examined the effect of background music and found that two musical properties, attention-gaining value and music/message congruency, influenced message reception within the advertising context. Due to the type of music and its incongruity with the ad message, the subjects' recall of the message was lower than in the case where the music was less conspicuous and more congruous. These results lead to an interesting question: Can attention-gaining music help reduce shoppers' crowding perceptions by redirecting their attention away from the undesirably dense retail environment? The results are consistent with the findings of an earlier study of incongruency theory by Hastie and Kumar (1979), who found that recall was higher for moderately incongruous situations. What role, if any, does incongruity play as the properties of background music in the shopping context are varied? What are the ideal combinations of music type and congruity levels that can be manipulated by the retailer in order to enjoy the high sales volumes from highly dense stores without creating negative consumer attitudes and behaviors due to retail crowding? Today's time-poor consumers, coupled with an increasingly competitive retailing industry, make it critical that the shopping environment provides consumers the maximum efficiency and pleasure. Given that reality, ele-

ments of store atmosphere, such as crowding and music, are likely to gain increasing research and managerial attention.

Further studies are needed to examine what other musical qualities can mitigate or accentuate the impact of crowding in the stores. Crowding is a two-edged blade that is, at once, desired and feared by retailers. Given these results, shoppers' crowding perceptions may be calibrated by using the "right" type and amount of background music in the retail context. Simply put, this study has shown that densely populated stores with fast-tempo music played in the background can amplify the tension and frustration resulting from retail crowding. Fairly empty stores, conversely, can aggravate sluggish impressions with slow-tempo music when what they really need is uptempo music to give shoppers a more lively impression.

In conclusion, this study is a first step in examining the simultaneous impact of two atmospheric variables that have been shown to independently influence shopper evaluations and behaviors in the retail context. The findings are consistent with the predictions of the schema incongruity theory as well as previous findings on crowding and music. Tentatively, the results seem to suggest using music as one possible atmospheric tool to minimize the negative effects that might accrue from crowding in the shopping environment. This is the first step toward understanding the combined impact of a host of environmental factors that make up one of the most powerful tools for retail managers, namely, the store atmospherics.

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