

Ronald E. Milliman

Using Background Music to Affect the Behavior of Supermarket Shoppers

This paper critically reviews the literature available and presents an empirical study that examines the effects of background music on in-store shopping behavior. It finds that music tempo variations can significantly affect the pace of in-store traffic flow and dollar sales volume.

ALTHOUGH music is generally thought of as an entertainment medium, it can also be used to achieve other objectives. In particular, music is employed in the background of production facilities, offices and retail stores to produce certain desired attitudes and behaviors among employees and/or customers. For example, background music is thought to improve store image, make employees happier, reduce employee turnover and stimulate customer purchasing.

Despite the widespread use of music in the marketplace, research documenting the effects of music is limited, and the results of existing research are inconclusive regarding its effects on consumer behavior. This is unfortunate because music is an atmospheric variable readily controlled by management. Past decisions to use background music in the marketplace have generally been based more on intuition or folklore rather than on strong empirical results.

The purpose of this paper is twofold: First, it crit-

ically reviews the existing literature on the subject, and second, it presents the results of a study examining the effects of background music on in-store shopping behavior.

Literature Review

Much of the existing literature is more directly concerned with the effects of music on attitudes rather than behavior. In many instances attitude measurements were taken, then generalizations were made about behavior. However, as very aptly pointed out by Wicker (1971) and Fishbein and Ajzen (1975), attitude measures and actual behavior often show only a weak relationship. Nevertheless, most of the studies cited below measure attitudes or beliefs or at best, intentions, none of which are necessarily correlated with behavior.

In a survey of 336 member firms conducted by the Personnel Research Committee of the Administrative Management Society, it was reported that a majority of corporations that provide music for their employees "believed" that this improved worker morale and relieved job monotony (Walter 1971). Another study of a similar nature surveyed the managers of 52 retail stores of various types. These managers expressed the "belief" that their customers bought more as a result

Ronald E. Milliman is Associate Professor of Marketing, College of Business Administration, Loyola University, New Orleans. The author wishes to acknowledge the valuable suggestions and encouragement given by the faculty of the College of Business at Loyola and the contributions of his wonderful wife, Palma, who serves as his tireless assistant, critic and eyes.

of the background music (76%) and that the music had a positive effect upon the customer's mood (82%). When the same managers were asked if their beliefs were based upon any actual research conducted either by themselves or, in the case of multi-store organizations, by the store's central office, the response was, without exception, "no" and/or "not that I know of." In the same study, 560 customers of these retail establishments were asked if they preferred stores that played music, 392 (70%) replied that they did. Additionally, 353 (63%) said that they either "purchased more" or "probably purchased more" in stores with background music playing while they shopped (Burleson 1979).

A survey of over 200 patrons of a New York area supermarket found that people preferred music playing in the background while they shopped (77%), and that this was a sign that the store's management cared about their customers (67%). Furthermore, the respondents expressed the "belief" that they would spend more time in a store with background music than in one without it (Linsen 1975).

All three of these studies examined attitudes or beliefs rather than behavior, although each concluded with generalizations about behavior. The weak attitude-behavior relationship observed earlier means that attitudes are not always a reliable indicator of behavior.

Most of the other studies that dealt more directly with behavior were not related to consumer behavior and seem to have had difficulty with their experimental controls. For example, a study conducted in conjunction with Eastern Airlines claimed turnover dropped 53% after the installation of a background music system (Roberts 1959). However, other changes in the environmental setting concurrent with the installation of the music system, such as modified work schedules and fringe benefit packages, may have contributed to the reduced turnover observed.

Similarly, another study conducted in cooperation with the Mississippi Power and Light Company reported that keypunch operators' productivity increased 18.6% and their errors decreased 37% as a result of the installation of a programmed background music system (Ross 1966). Here again, however, the experimental design and related controls were inadequate to conclude, with a high degree of confidence, that the introduction of background music into the work environment caused the increased productivity and improved quality of worker output.

Thus, much of the controversy suggested in this paper and by other authors pertaining to the question of "can background music affect behavior?" still remains (Brayfield and Crockett 1955; Jacoby 1968; McGehee and Gardner 1949; Smith 1947; Uhrbrock 1961). However, one consumer behavior study, con-

ducted in two large supermarkets, does not suffer from the limitations of the research previously cited. The study examined the loudness of music (as the independent variable) and its effects upon shopping behavior. In this case, music was varied from loud to soft in eight counter-balanced experimental sessions. It was found that significantly less time was spent in the stores when the music was loud compared to when it was soft, although there was no significant difference in sales or in the customer's reported level of satisfaction (Smith and Curnow 1966).

These findings would seem to lend support to Grayston's (1974, p. 38) premise that "the music must fit the situation in which it is to be used. The wrong music can produce effects that totally neglect the objective of the exercise." In view of this premise and Smith and Curnow's findings, it would seem more appropriate to study the effects of various dimensions of music in particular settings (soft-loud, fast-slow), rather than attempt to draw conclusions about the effects of music in general. The study that follows presents further evidence supporting Grayston's statements.

The Study

This study examines the possible link between the use of programmed background music and behavior, specifically, in-store shopping behavior. A type of latin square experimental design with controls was used to investigate the effects of three treatment variations on the in-store shopping behavior of supermarket customers. These treatments were: (1) no music, (2) slow tempo music, and (3) fast tempo music. These music tempo variations were chosen as experimental treatments because of a claim made in the sales literature of a nationally known marketer of programmed background music systems that music tempo, among several other factors, could be varied to affect human behavior. When contacted, the firm refused to produce research data in support of its claim. Therefore, tempo was selected as the independent variable for this research to find out whether, in fact, a link existed between music tempo and human behavior.

Hypotheses

For reader convenience, the following three hypotheses are stated in positive form. The experimental treatments of no music, slow tempo music and fast tempo music will significantly affect (1) the pace of in-store traffic flow of supermarket shoppers, (2) the daily gross sales volume purchased by supermarket customers, and (3) the number of supermarket shoppers expressing an awareness of the background music after they have left the store.

Research Design

This study was conducted in a medium-size store operated by a large, nationally known chain of supermarkets. The store is located in a southwestern U.S. city with a population of approximately 150,000. The store's patrons are predominantly middle-class Anglo-Saxons. Additionally, the store had been in existence at its current location for several years and had a reasonably stable core market.

The study covered a nine-week period starting on January 28 and ending on March 31, 1980. The timing was very important, as it made it possible to fit nine weeks nicely between two holidays—New Year's and Easter—in such a way as to maximize experimental controls and minimize the effects of holiday shopping on the research results.

It should also be pointed out that to minimize the influence of various exogenous factors and maximize experimental controls, the normal level and timing of advertising was placed during these nine weeks. In addition, all other variables such as in-store promotions, point-of-purchase displays, store layout and all atmospheric conditions were kept as constant as possible.

Independent Variable

The independent variable of this research consisted of three background music treatments. To be more precise, multiple comparisons were made among the treatments of no music (designated M_0), slow tempo music (designated M_1), and fast tempo music (designated M_2). It became imperative to develop an operational definition for the music variables slow tempo and fast tempo; that is, how slow is *slow* and how fast is *fast*? To answer this a sample was selected at random from the trading area of the supermarket. Subjects were chosen to reflect the age, sex and other relevant socioeconomic characteristics of the store's customers. Each subject was asked to listen to several instrumental musical arrangements and to classify them as slow, fast or somewhere in between. A total of 95% of the subjects classified musical selections with a tempo of 72 beats per minute or fewer as slow. Selections with a tempo of 94 beats per minute or more were classified as fast. Thus, the range from 73 to 94 beats per minute was considered between fast and slow, although this category was not directly a part of this study. Therefore, based on these findings, slow tempo music was defined as having a tempo of 72 beats per minute or fewer, an average of 60 and a standard deviation of 6. Fast tempo music was defined as having 94 beats per minute or more, an average of 108 and a standard deviation of 7. However, perceptions of slow and fast may vary across geographic regions or demographic parameters and,

therefore, the reader must be cautioned against generalizing these findings too far beyond the scope of this study.

It should also be pointed out that only instrumental selections were employed in this experiment. It was believed that using exclusively instrumental pieces would allow for greater control over the music variable, as no concern had to be given to female versus male vocalist, popular versus less popular artists, etc.

After defining the operational parameters of the independent variable, the rest of the experimental design was developed for the in-store tests. A replicated, random block experimental design was employed. That is, the experimental treatments, M_0 , M_1 and M_2 , were randomly assigned to each day of the week, with each treatment-day combination having three replications over the nine-week test period. A random number table was used to determine which treatment would be selected to begin the rotation schedule. Thus, since zero was the first eligible number appearing in the table and two was the next selectable number, the rotation schedule became M_0 , M_2 , then M_1 . Hence, with the study beginning on a Sunday, M_0 -Sunday was the first treatment-day combination, M_2 -Monday was the second, and M_1 -Tuesday was the third. M_0 recurred on Wednesday and so forth.

M_1 and M_2 each consisted of 40 different instrumental musical selections. The order of presentation for the different pieces was randomly assigned. In addition, the music selected tended to accentuate the rhythm or cadence enough so that while not dominant, it was easily discerned. Further, as a result of the findings of previously cited research (Smith and Curnow 1966), the volume of the music was maintained at a constant level throughout the nine-week experimental period. To make this procedure more precise, a decibel meter was used. The music's volume level was set to be perceived as soft background music, though clearly audible from all parts of the store. Each experimental treatment was run through its entire assigned day (from store opening to store closing) without intermission. Finally the PA system over which the music was played was also used for in-store announcements. However, it was assumed that because these announcements were infrequent, random and across all treatments, they would not significantly affect the results of this study.

Dependent Variables

The first dependent variable for which data was needed was the pace of in-store traffic flow. To obtain this information, shoppers were observed as they passed between designated points in the supermarket. The time it took each customer to pass between these locations was recorded in seconds. These measurements were restricted to one day of the week, in the

evening, and for one hour because of the limitations placed upon the researchers by the store's management. In compliance with these extremely tight limitations, Wednesday was randomly selected, and all pace of in-store traffic flow measurements were made on this day. Further, to minimize any possibility of arousing management's anxiety, the pace of the first five customers moving between these designated points from 7:00 p.m. to 8:00 p.m. was recorded. Hence, because every treatment-day combination was replicated three times over the nine-week experimental period, each of the music variables, M_0 , M_1 and M_2 was tested over three different Wednesdays. These data were then collected and tested in an attempt to determine whether the tempo of the music had any effect on the pace of in-store traffic flow.

The second dependent variable was daily gross sales. This information was obtained by simply adding all of the cash register totals for each day and recording these amounts with the appropriate treatment. Subsequently, these data were tested to determine whether variations in gross sales receipts could be attributed to the experimental treatments.

To gather data for the third dependent variable, music awareness, customers were randomly selected outside the supermarket as they were leaving. Each subject was asked, "Do you recall music playing in the supermarket while you were shopping?" The subjects were given the response choices of (1) yes, (2) not sure or (3) no. The interviews were conducted on two randomly chosen days of each treatment. Thus, a total of 36 customers were interviewed for each of the six days.

To test hypotheses 1 and 2 pertaining to the pace of in-store traffic flow and daily gross sales, respectively, the analysis of variance statistical procedure was used for the overall test of significance. This technique was selected because it best met the requirements of the data and was readily available for computer processing. When justified, more in-depth analysis was made using the t test. In the case of hypothesis 3, music awareness, the chi-square procedure was more appropriate for the type of data collected. Although the 0.05 level of significance was the acceptance criterion for all statistical tests, absolute probabilities are reported for all findings.

Results of the Study

Pace of In-Store Traffic Flow

The overall analysis of variance test indicated a highly significant difference or differences somewhere among the three treatments ($F = 4.85$, $2/42$ df, $p = .01$). The t test was used to determine which pair or pairs

TABLE 1
Summary of t Tests Results for Pace of In-Store Traffic Flow and Sales Volume

Dependent Variable	Groups	df	t Value	Prob.
Pace	No music with slow tempo music	28	-1.25	0.222
	No music with fast tempo music	28	1.82	0.079
	Slow tempo music with fast tempo music	28	3.18	0.004
Sales Volume	No music with slow tempo music	40	-1.12	0.271
	No music with fast tempo music	40	1.41	0.165
	Slow tempo music with fast tempo music	40	2.53	0.016

of treatments produced the significant results. As shown in Table 1, it was found that:

- There was no significant difference between treatments M_0 and M_1 ($p = 0.22$).
- There was no significant difference between treatments M_0 and M_2 ($p = 0.08$).
- There was, however, a clearly significant difference between treatments M_1 and M_2 ($p = 0.004$).

The results of these tests indicate that the pace of in-store traffic flow was significantly slower with the slow tempo music (M_1 mean = 127.53 seconds) than for the faster tempo music (M_2 mean = 108.93 seconds). Additionally, it is interesting to note the slower tempo of M_1 stimulated an even slower pace than no music (a mean of 127.53 seconds for M_1 compared to a mean of 119.86 for M_0), although this difference was not considered statistically significant. In what appears to be a similar pattern, no music at all resulted in a slower traffic flow than that of the fast tempo music (M_0 mean = 119.86 seconds compared to M_2 = 108.93 seconds), although this difference was not considered statistically significant because it fell just short of the level of significance accepted in this research (0.05). However, in the final analysis, hypothesis 1 was accepted; that is, based upon these findings, there is sufficient evidence to conclude that the tempo of in-store background music can significantly affect the pace of the in-store traffic flow of supermarket customers.

TABLE 2
The Effects of Music Tempo Upon the Awareness of In-store Music

Response choice	No Music			Slow Tempo Music			Fast Tempo Music			$\Sigma \chi^2$
	N	%	χ^2	N	%	χ^2	N	%	χ^2	
Yes	21	9.72	.375	25	11.57	.042	27	12.50	.375	0.792
Not sure	24	11.11	0	24	11.11	0	25	12.50	.042	.042
No	27	12.50	.375	23	10.65	.042	20	9.26	.667	1.084
Total χ^2										1.918

($P < .95$, not significant).

Sales Volume

Here, too, when the three independent variables were examined together with the analysis of variance procedure, a significant difference was found ($F = 3.21$, $2/60$ df, $p = .05$). Thus, a more in-depth investigation of the relevant data was appropriate (see Table 1). The t test showed that:

- There was no statistically significant difference in sales volume between treatments M_0 and M_1 ($p = 0.27$).
- There was no significant difference between treatments M_0 and M_2 ($p = 0.17$).
- There was a highly significant difference in sales volume between treatments M_1 and M_2 ($p = 0.02$).

The higher sales volumes were consistently associated with the slower tempo musical selections while in contrast, the lower sales figures were consistently associated with the faster tempo music (M_1 mean = \$16,740.23 compared with M_2 mean = \$12,112.85). This difference is significant, and these findings follow quite logically from the in-store traffic flow results. That is, as customers move more slowly through the store, they tend to buy more. Conversely, as customers move more quickly through the store, they tend to purchase less. Nevertheless, there is sufficient evidence to accept hypothesis 2 and conclude that the daily gross sales volume purchased by supermarket customers can be significantly influenced by the tempo of the in-store background music.

Awareness of In-Store Background Music

The chi-square statistic was used to test whether there was any significant difference in the level of music awareness among the three independent variable treatment groups because the data for this dependent variable were expressed as frequencies. However, the analysis failed to reveal any significant variations in the subjects' responses ($p = 0.97$, $df = 8$, $\chi^2 = 1.92$, see Table 2). Therefore, in accordance with accepted

research and statistical procedures, there was no further manipulation of the data beyond the overall chi-square test, and hypothesis 3 was rejected as stated. That is, the subjects in one treatment group were found to be no more or less likely to recall the music than subjects in another group. Additionally, it should be noted that there were no statistically significant differences in the number of subjects selecting each response choice, although more said "not sure" than either of the other two choices. Thus, subjects were something less than totally conscious of the music while shopping, but it cannot be said that they were completely unaware of it. Rather, the music may have been in the background of the shoppers' perceptual fields. Nothing definite, however, can be stated about the customer's exact level of music awareness while shopping. It does point to the possibility of subconscious motivational effects on in-store shopping behavior.

Conclusion

The reader must be cautioned against generalizing these findings too far beyond the scope of this study. The results may not apply to all supermarkets, nor to any other market situation. There is a need for more research in this area, not just concerning the effects of music on behavior but also in the whole area of "atmospherics."

This study along with others like it, can help marketing managers interested in influencing the behavior of consumers. The tempo of instrumental background music can significantly influence both the pace of in-store traffic flow and the daily gross sales volume purchased by customers, at least in some situations. In this study the average gross sales increased from \$12,112.35 for the fast tempo music to \$16,740.23 for the slow tempo music. This is an average increase of \$4,627.39 per day, or a 38.2% increase in sales volume.

The exact figures are not important, as they pertain only to this research situation. However, what

these findings say is important: It is possible to influence behavior with music, but this influence can either contribute to the process of achieving business objectives or interfere with it. Thus, it would appear that Grayston was correct in saying that the music chosen and its intended objectives must be matched.

Certainly, in some retailing situations the objective may be to slow customer movement, keeping people in the store for as long as possible in an attempt to encourage them to purchase more. However, in other situations, the objective may be the opposite, that is, to move customers along as a way of increasing sales volume. A restaurant, for instance, will most likely want to speed people up, especially during lunch, when the objective is to maximize the "number of seats turned" in a very short period of time, normally about two hours or less. Playing slow tempo

music in a restaurant might result in fewer seats turned and lower profit, although it could encourage return visits if customers preferred a relaxed luncheon atmosphere. Again, the point is that the music chosen must match the objectives of the business and the specific market situation.

Finally, this study raises as many questions as it answers. It appears that the effect of music on behavior is at a relatively low level of awareness; thus, a more accurate determination of the precise level of awareness needs to be made. In addition this study raises the issue of what influence, if any, does background music have upon the employees of a business? Does such an effect exist? Is it important? There could even be an "interaction effect" between the employees' behavior and the customers' behavior. A definite need exists for more research in this area.

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