ALCOHOLISM: CLINICAL AND EXPERIMENTAL RESEARCH

Vol. 32, No. 10
October 2008

Sound Level of Environmental Music and Drinking Behavior: A Field Experiment With Beer Drinkers

Nicolas Guéguen, Céline Jacob, Hélène Le Guellec, Thierry Morineau, and Marcel Lourel

Objective: It had been found that environmental music was associated with an increase in alcohol consumption. The presence versus absence of music, high versus slow tempo and the different styles of environmental music is associated with different level of alcohol consumption. However, the effect of the level of the environmental music played in a bar still remained in question.

Methods: Forty male beer drinkers were observed in a bar. According to a random distribution, patrons were exposed to the usual level of environmental music played in 2 bars where the experiment was carried out or were exposed to a high level.

Results: The results show that high level volume led to increase alcohol consumption and reduced the average amount of time spent by the patrons to drink their glass.

Conclusions: The impact of environmental music on consumption was discussed and the "arousal" hypothesis and the negative effect of loud music on social interaction were used to explain our results.

Key Words: Young Adults, Environmental Music, Music Influence, Alcohol Consumption.

ENVIRONMENTAL MUSIC IS known to affect behavior and particularly the consumer's behavior. Several experimental studies carried out in natural settings have shown that different environmental music and structural components of the music (e.g., sound level, tempo, tonality) affect the consumer's behavior such as in-store traffic flow (Milliman, 1982), sales volumes (Areni and Kim, 1993), product choices (North et al., 1999) or time elapsed in a commercial area (Milliman, 1986).

It was shown in social psychology literature that drinking behavior is affected in multiple ways by environmental music. Drews et al. (1992) shown that male beer drinkers unobtrusively observed in 2 bars, drank significantly more beer when environmental music was played than when the music was off. Milliman (1986), when examining the effect of music on the behavior of restaurant patrons, shown that a slower music tempo led to an increase in the average dollar amount of bar charges per customer. These findings were recently confirmed by Caldwell and Hibbert (1999). The style of music played in a store, in a bar or in a restaurant could influence the choice of drinks. North et al. (1999) underlined the fact that customers' selection of French and German wines was strongly affected by stereotypic French and German environmental music played in the store. French music increased the sales of French wines compared to German ones whereas German music led to the reverse effect. Jacob (2006) had conducted an experiment in a bar to test the influence of 3 different styles of music on patrons. According to a random assignment, patrons were exposed to top 40 music, which was usually played in the bar, cartoon music or drinking songs. Results showed that drinking songs appeared to increase the length of time customers stayed in the bar and the average amount spent.

An aspect of the structural components of music that has been studied less as far as drinking behavior is concerned is the sound level. A recent experiment of Guéguen et al. (2004) had tested the effect of sound level on drinking behavior in a bar. An experiment was carried out in 2 bars to test patrons' response to music loudness. Using random assignment, patrons were exposed to a sound level which was higher than that usually employed in the bars in which the study took place. Analysis showed that a sound level higher than usual was associated with consuming more drinks. An "arousal" hypothesis was used to explain the findings. The high sound level created a high level of arousal in the customers which led them to enhance their behavioral response toward the stimulus. High tempo was assumed to have the same property to enhance arousal that also enhanced the behavioral response of the perceiver. McElrea and Standing (1992) found that fast music significantly decreased the amount of time spent on consuming a drink. Again, these results were explained by the authors by high "arousal" level induced by high tempo music. In the study of McElrea and Standing the same music was played with a different tempo. Furthermore, the effect of the music played could have a different effect on drinking behav-

From the Laboratoire Gestic, UFR LSHS, Université de Bretagne-Sud (NG, CJ, HLG, TM), Lorient Cedex, France; and the Laboratoire PsyNCA, Université de Rouen (ML), Mont-Saint-Aignan Cedex, France.

Received for publication February 1, 2008; accepted June 3, 2008.

Reprint requests: Nicolas Guéguen, Laboratoire Gestic, UFR LSHS, Université de Bretagne-Sud, 4 rue Jean Zay, BP 92116, 56321 Lorient Cedex, France; Fax: 33 2 97 67 65 37; E-mail: nicolas.gueguen@univ-ubs.fr

DOI: 10.1111/j.1530-0277.2008.00764.x

ior. Bach and Schaefer (1979) found that the slower the tempo of country western music was, the faster barroom patrons consumed their drinks. For the authors, perhaps slow tempo elicited a mood that in turn elicited rapid drinking.

The purpose of the present experiment was to confirm the effect of sound level of environmental music on drinking behavior in a natural setting and to find the mediating effect that could explain the increase of consumption. Because it seems that high sound level could create high arousal level, we hypothesized that high sound level compared to a moderate sound level should lead the customer to drink more. We hypothesized that high sound level led the patrons to decrease the amount of time spent to drink their glass. So the increase in alcohol consumption would be explained by a decrease in the amount of time spent to drink the glass.

METHOD

Participants

The participants were 40 patrons (40 males, aged 18 to 25) who unknowingly participated in the study and were observed at random in 2 bars situated in a medium-size city (more than 70,000 inhabitants) in a very attractive spot located in the west of France on the Breton Atlantic Coast. These 2 bars were famous bars for young people in the town where the experiment was carried out. Each observation was made by considering a table where 2 participants were seated. Observations were limited to pairs of participants, because individuals drinking alone were few and unrepresentative of the normal social pattern. Tables with more than 2 participants led to some difficulties in making correct information. Only patrons who had ordered a glass of draft beer (25 cl or 8 oz) were used as "participants" in this experiment (about 70% of the alcohol consumption in the 2 bars where the experiment was carried out because beer is an alcohol that is not very expensive in French Bars compared to Soda or to drinks with high level of alcohol like Vodka, Whisky, Rum...). That way it was possible to evaluate the consumption behavior with the same category of product and with the same capacity.

Procedure

The observations were made during 3 saturday nights with the consent of the owners of the bars. 2 observers situated in 2 different places in the bars where the experiment took place were used. Before selecting a participant, the sound level of the environmental music was manipulated according to a randomization scheme. The level of environmental music was randomly selected and then observations were conducted until the last participants left the bar. Then a new random selection of the environmental music was done and new participants were selected between patrons who entered the bar. The experimental environmental music played in the 2 bars was the same as the music usually played (top-forty music in both bars). In the control condition, the sound level used was the same as on usual days (72 dB). In the high level condition, the environmental music was played at a level of 88 dB in the 2 bars. Volume levels were measured by a decibel meter placed near the middle of the room (A Velleman decibel meter, model VELL 1326, Velleman, Inc., Gavere, Belgium). The high level was selected according to the previous work of Kellaris and Altsech (1992) and in our previous study Guéguen et al. (2004). It was found that 88 dB was a level considered by subjective evaluation as a typical level of "foreground music." This level was also considered by the owners of the 2 bars as the maximum level they could use. Hence it was decided to take 72 dB as the typical level ordinarily used in the bars in which the experiment took place, whereas 88 dB was considered the highest level.

Table 1. Mean and Standard Deviation (in brackets) of Drinks Ordered, Time Spent, and Number of Gulps Used to Drink a Glass of Beer According to the Level of Loudness of the Environmental Music

Level of environmental music	Number of drinks ordered	Time spent to drink a glass (in minutes)	Number of gulps per drink
Usual level	2.6 (1.14)	14.51 (4.88)	7.02 (1.26)
High level	3.4 (0.99)	11.45 (2.89)	7.18 (1.29)

After selecting the sound level session, the observers waited for the patrons who first entered the bar. If the patrons were males, in a pair and that one of them ordered an 8 oz glass of draft beer, they were selected as participants. If the 2 patrons ordered an 8 oz glass of draft beer, both were observed. If the patrons were alone or were in a group of more than 2 people, observers waited until a pair of patrons entered. The observers were instructed to observe discretely the pair of participants and to count the drinks ordered until they left the bar. For each drink, one of the observers was instructed to note the amount of time spent by each participant to drink their glass (the time elapsed between the moment the participant received his glass and the moment the participant finished his glass). The other observer was instructed to note the number of gulps used by each customer to drink each glass. The 2 observers were instructed to note their data on a piece of cardboard.

RESULTS

The 3 dependent variables used in this experiment were the number of drinks ordered by each patron observed, the amount of time spent to drink each glass of beer, and the number of gulps used for each glass. The results obtained in the 2 environmental music conditions are presented in Table 1.

For each dependent variable, the difference between the 2 experimental conditions was tested by the help of an unpaired t-test. With the number of drinks consumed a main effect of the sound level of environmental music was obtained [t (38, two-tailed) = 2.37, $p < 0.03$, df = 0.77]. Then it appeared that high level of environmental music was associated with an increase of drink consumption. With the time elapsed between the moment the participant received his glass and the moment he finished it, a main effect of environmental music was found [t (38, two-tailed) = 2.36, $p < 0.03$, df = 0.76] revealing that with a high level of environmental music, patrons spent significantly less time to drink their glass than in the control condition where the level was the same as usual. With the number of gulps used to drink each glass of beer, despite the apparent differences between the 2 means, no statistical difference was found [t (38, two-tailed) = 0.40, ns, df = 0.13] revealing that the number of gulps to drink 8 oz of draft beer was not different when a volume of environmental music higher than usual was used. Correlation between these two later dependent variables (time spent to drink the glass and number of gulps to drink it) revealed a significant relation in the high volume condition [$r(19) = 0.73$, $p < 0.001$] and

in the usual control volume condition [$r(19) = 0.69$, $p < 0.001$].

DISCUSSION

Our 2 hypotheses were supported by the results presented hereafter. When the sound level was high this led to an increase in consumers' drinking speed. Then our first hypothesis was confirmed and the results were congruent with previous research which found an effect of a high environmental music level on barrooms patrons (Guéguen et al., 2004). The second hypothesis was confirmed by our data. High environmental level music was associated with a decrease in the amount of time spent by the patrons to drink their glass. As it appeared in the 2 experimental conditions, time spent to drink a glass and the number of gulps was positively associated, but the number of gulps was the same in both groups. Such statistical effects led to gather that the volume of each gulp remained constant in the 2 experimental groups. If the average amount of time spent to drink a glass decreased with high environmental music level, that led to gather that the latency between each gulp was reduced in this experimental condition.

How to explain this effect of environmental music level on alcohol consumption in a bar? Several theoretical factors could explain our results. First, this effect could be explained by the "arousal hypothesis" advanced by several scientists who worked on the effect of environmental music on human behavior. Roballey et al. (1985) found that patrons exposed to fast music increased the number of bites per minute. Similarly, McElrea and Standing (1992) found that fast music significantly decreased the time spent by the subjects to drink a soda. Such results could explain our findings. Following the arousal interpretation in the present experiment, the high sound level led to higher arousal, which led the subject to drink faster and to order more drinks. However, if this explanation could be appropriate to explain this measure, further experiments are now necessary. First, in Roballey et al. (1985) study and in McElrea and Standing's (1992) study, patrons were exposed to fast versus low music and not loud volume versus usual volume. Second, in these studies and in our experiment, no measure of this arousal effect had been introduced. It will be now necessary to perform a similar experiment where dependent variables related to arousal will be measured. For example, perhaps exposure to loud music changed the clients' subjective perceptions of time passage. Loud music can distract from the "internal clock" or make the internal clock run faster (relative to objective clock time). Yet, this perception of time is also an arousal effect, but it explains more about how and why the arousal effect influences the behavior. Various physiological dependent variables are also related to arousal such as cardiac frequency, blood pressure... Then it will be interesting to solicit participants for these physiological measures in the 2 music level conditions.

Another possible explanation of our data is related to the negative effect of loud music on social interaction in the bar where the experiment was carried out. Perhaps loud music impedes conversation, so that bar clients drink more because they talk less. This theoretical statement found empirical validation in a very recent study conducted by Forsyth and Cloonan (2008). These authors have examined the use of music in city center pubs in Glasgow, Scotland. Their research involved a face to face in-depth interviews with a member of a bar and observation via mixed-couples who observed the behavior of the customers and employees. They found that loud music prevented any kind of conversation and increased the customers' drinking speed. Such behavioral observations give empirical validation that loud music could prevent conversation which, in turn, could increase drinking consumption. Thus, it will be interesting in further research to test the impact of sound level on the level conversation between the customers and to correlate this data with the same behavioral measures of drinking consumption used in this experiment. It will also be appropriated to perform the same experiment focusing only on drinkers who are on their own in order to compare their behavior with drinkers in dyads or in larger groups.

Of course, some limitations are associated with this experiment. The experiment was carried out in 2 bars and could not be generalized to every place. It will be interesting to evaluate if loud music is associated with the same effect with large sample sizes of bars and if the same effect occurs according to the type of bars or the type of clients. It will also be interesting to conduct a survey to find out if patrons are aware of the effect reported here and if some of them take advantage to sell more drinks in less time. Another limitation is associated with the participants observed in this experiment. The drinking behavior observed in the 2 conditions was limited to male-dyads in this experiment and cannot be generalized to every type of dyad. Perhaps the results might differ with male–female pairs because in such condition the members are more engaged in conversation. In Guéguen et al. (2004) study, no difference was found according to gender in the dyads observed, but the sample size of mixed-gender dyad was small and the evaluation of this gender effect still remains in question.

Our results have some health implications. In France, more than 70,000 persons per year die because of chronic alcohol consumption and alcohol is associated with the majority of fatal car accidents. With such an experiment and previous experiments on the same topic, it is clearly demonstrated that environmental music played in a bar is associated with an increase in alcohol consumption. It will be necessary to make aware the owners of bars or restaurants that the single presence of music (Drews et al., 1992), the style of music played (Jacob, 2006) or the structural components of the environmental music such as tempo (McElrea and Standing, 1992) or sound level (Guéguen et al., 2004) is associated with more alcohol consumption and, in turn, related to health and social problems associated with such chronic consumption. It will be interesting to encourage the owners of bars to display music with a moderate level in order to struggle against alcohol consumption. Making the clients aware that loud music

influences their alcohol consumption with the help of TV advertisements, radio advertisements or poster advertising is an opportunity for consumer education. Indeed, such effects of environmental music on alcohol consumption could also be used to evaluate the impact of music on soft drink consumption. Again, it will be an interesting question for further experiments to address.

REFERENCES

Areni C, Kim D (1993) The influence of background music on shopping behavior : classical versus top-forty music in a wine-store. Adv Consum Res 20:336–346.

Bach PJ, Schaefer JM (1979) The tempo of country music and the rate of drinking in bars. J Stud Alcohol 40:1058–1059.

Caldwell C, Hibbert S (1999) Play that one again: the effect of music tempo on consumer behaviour in a restaurant. Eur Adv Consum Res 4:58–62.

Drews DR, Vaughn DB, Anfiteatro A (1992) Beer consumption as a function of music and the presence of others. J Pa Acad Sci 65:134–136.

Forsyth AJM, Cloonan M (2008) Alco-pop?: The use of popular music in Glasgow pubs. Pop Music Soc 31:57–78.

Guéguen N, Jacob C, Le Guellec H (2004) Sound level of background music and consumer behavior: An empirical evaluation. Percept Mot Skills 99:34–38.

Jacob C (2006) Styles of background music and consumption in a bar: An empirical evaluation. Int J Hosp Manage 254:716–720.

Kellaris J, Altsech M (1992) The experience of time as a function of musical loudness and gender of listener. Adv Consum Res 19:725–729.

McElrea H, Standing L (1992) Fast music causes fast drinking. Percept Mot Skills 75:362.

Milliman R (1982) Using background music to affect the behavior of supermarket shoppers. J Mark 46:86–91.

Milliman R (1986) The influence of background music on the behavior of restaurant patrons. J Consum Res 13:286–289.

North A, Hargreaves D, McKendrick J (1999) The influence of in-store music on wine selections. J Appl Psychol 84:271–276.

Roballey T, McGreevy C, Rongo R, Schwantes M, Steger P, Winiger M, Gardner E (1985) The effect of music on eating behavior. Bull Psychon Soc 23:221–222.