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Effects of background music on consumer behaviour: behavioural account of the consumer setting

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Consumer atmospherics is a research area that investigates the effects of specific environment characteristics on consumer behaviour. The behavioural perspective model was proposed as a behavioural account of consumer settings. The purpose of this research was to present a method for investigating an atmospheric variable in a consumer setting. The quality of background music of a mall was manipulated, observing its effects on consumer behaviour in two stores. Results showed that in the higher quality condition, there was an increase in cash flow and in verbal reports of pleasure and a decrease in conversion rates. The interpretation of these results as a motivational operation is proposed. The results point to further investigation of scenario features related to reinforcement contingencies and their effects on consumer behaviour.

Keywords: atmospherics; behavioural perspective model; background music; consumer behaviour analysis

Introduction

Consumer atmospherics has been, for many years, a fertile research area in the marketing and retailing literature, including both theoretical and empirical work. Puccinelli et al. (2009), for example, present atmospherics as a powerful tool for enhancing consumer experience in retail and link it to the evaluation, purchase, and post-purchase stages of consumer behaviour. These authors posed an important question, still pending in the literature, as to how atmospheric factors influence sales and profits, in addition to their effects upon evaluation and intentions and how to develop the correct metrics to measure these effects. Verhoef et al. (2009) proposed a holistic conceptualization of consumer experience that integrates retail atmosphere, service interface, social environment, assortment, price, retail brands, and customer experience as jointly determining consumer experience. These authors also suggest customer and situational moderators that could alter the effects of each variable described.

Some recent empirical studies have been dedicated to the investigation of isolated environmental attributes. Spangenberg, Sprott, Grohmann, and Tracy (2006) developed a field study to investigate the effects of stores scents on consumer behaviour. Morrin and Ratneshwar (2000) conducted laboratory research to observe the impact of odours in brand evaluation. Chebat and Michon (2003) investigated the effects of a mall's scent on shoppers' emotions, cognitions, and amount spent, favouring a cognitive theory of emotions as the best explanation of the results found. Guéguen and Petr (2006) manipulated

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the scent of a restaurant and discovered the positive effect of lemon scent on length of stay of customers and the amount they bought. Focusing on music as atmospherics, Morin, Dubé, and Chebat (2007) conducted two studies in real and online environments to observe the effects of background music on service evaluation and purchase intentions. All the described studies obtained statistically significant effects of discrete atmospheric features on consumer behaviour. There is also a crescent trend in studies analysing the interaction between environmental factors and the congruity between personal factors and environmental attributes (e.g. Cameron, Baker, Peterson, & Braunsberger, 2003; Mattila & Wirtz, 2001; Michon, Chebat, & Turley, 2005; Spangenberg, Grohmann, & Sprott, 2006). Although these studies emphasize the importance of atmospherics management in retailing, they adopt a wide variety of methods and are based on different theoretical frameworks, rendering it difficult for generalization of results to new areas. The main objective of the present research was to propose a methodology for the investigation of atmospheric phenomena based on the behavioural perspective model (BPM), developed in an experimental intervention on the background music of a shopping mall.

Literature review

Smith and Curnow (1966) were the first to publish a research investigating the effects of environmental manipulations on consumer behaviour. They manipulated the volume of the background music and observed its effects on shopping duration, total amount of sales, and perceptions of the environment. Despite the results encountered, the authors did not suggest any elaborate theory to account for it or managerial implications of the phenomenon. The concept of *atmospherics* was first used by Kotler (1974), and he defined it as an effort to create shopping environments that would enhance the probability to buy through emotional effects on the consumer. Although the role of emotional reactions of the consumers were clearly stated in this definition, it was Donovan and Rossiter (1982) who offered the strongest theoretical basis for explaining the relation proposed, adapting the P–A–D theory (Mehrabian & Russell, 1974) from environmental psychology to the consumer scenario. The theory suggests that the effects of environmental stimuli on behaviour are mediated by a three-dimensional emotional structure, consisted of pleasure–displeasure, arousal–non-arousal, and dominance–submissiveness continua (there are some debates regarding the three-dimensional structure; see Yani-de-Soriano & Foxall, 2006 for an in-depth analysis of this controversy). Depending on how an environmental stimulus is interpreted in this orthogonal classification, it evokes either approach or avoidance consumer responses. Following this lead, since then most theoretical explanations of atmospherics have adopted P–A–D as theory of choice (see e.g. Newman, 2007) or other theories in which emotions play a determining role in the prediction of the impact of environmental cues (as in Han, Back, & Barrett, 2010).

In a review analysing the literature from 1964 to 1997, Turley and Milliman (2000) discovered 60 articles that met his criterion for belonging to the area, and all of them showed significant relations between the so-called atmospheric variables and consumer behaviour, despite the enormous diversity in independent and dependent variables manipulated. In most of the cases, the atmospherics independent variables are associated with the store's physical environment (room temperature, scents, background music, etc.), but there are studies showing the impact of crowding (Li, Kim, & Lee, 2009) and of employee personal characteristics and personality traits (Ekinsi & Dawes, 2009; Sun & Lin, 2010) on consumer intentions and satisfaction. The most frequent dependent variables observed in the studies were total sales amount, shopping time, and approach and avoidance behaviours.

Background music as atmospherics

Garlin and Owen (2006) narrowed the focus of their literature review on research involving background music as independent variable and examined 150 articles, only 32 of which were amenable to meta-analysis treatment. Thirteen of these studies (41%) measured affective variables as the dependent variable, which shows the emphasis on emotional states as moderators of environmental effects (Areni & Kim, 1993; Bitner, 1992), and all of them reported small to moderate effects. The authors summarized their findings in five points:

- (1) familiarity/musical taste has positive effects on consumers;
- (2) the mere presence of music has positive effects on consumers and on perceived pleasure;
- (3) high tempo, high volume, and less known music increase shopping duration;
- (4) shopping duration is overestimated with high tempo and high volume music and with less likable music;
- (5) music tempo has greater impact on arousal.

However, as in Turley and Milliman (2000), the authors seem to overlook the great diversity of behavioural processes involved in the studies with music as independent variable. Grouping musical tempo, volume, familiarity, and taste as one environmental process seems to misrepresent the phenomena considered.

Considering the results reported by Garlin and Owen (2006), those described by Turley and Milliman (2000), and the review of recent studies, the atmospherics literature presents at least two problems. First, the poor conceptualization of the phenomenon may lead to very abstract theorization. One should not expect that the effect of the familiarity of a scent on consumer behaviour to be at the same level of explanation as the impact of its chemical composition on the same consumer, for the former depends clearly on consumer learning history and the latter does not (or at least does to a lesser extent). And, secondly, although there is evidence of the effect of environmental manipulations on consumer behaviour, the proposed managerial implications of these results are somewhat vague. As long as the focus of research (i.e. dependent variables) remains on emotional states evoked by atmospheric events, there is little to offer for retail managers. If one suggests an increase in pleasure and arousal as a way to increase sales in a particular store, managers' next question would be: how can I do this?

The BPM

Foxall (1990, 1998, 1999) proposed a model based on an interpretation of Skinnerian radical behaviourism that conceptualizes consumer behaviour as standing in the intersection of consumer learning history and consumer setting, which signals consequences for different consumption responses. In this model, named the BPM, it is stated that in order to explain consumer behaviour, one ought to investigate its antecedent and consequent events and determine the dynamics of this system (Foxall, Oliveira-Castro, Yanide-Soriano, James, & Sigurdsson, 2006). The consequences of consumer behaviour are threefold: utilitarian, informational, and aversive. Utilitarian consequences (or utilitarian reinforcers) are defined by the value derived from owning or using a product or service; informational consequences (or informational reinforcers) are determined by the social prestige or performance feedback delivered by a social group upon the use or ownership of a product or service; and aversive consequences are associated with the money, effort, and time spent for purchasing or using a product or service. These three types of

consequences are associated with each consumer behaviour and they tend to interact in a real marketplace (i.e. high informational products tend to be higher in price, an aversive consequence, when compared with low informational products).

The learning history of consumers will determine how they act upon a current environment. Part of what is understood as personal values, attitudes, intentions, and personality, in the cognitive literature, is considered by analysing consumer learning history, and in most cases, researchers can only probe into the consumer history aided by questionnaires, interviews, or by looking at previous buying behaviour. Finally, the consumer setting may be defined as the physical, social, and regulatory attributes of the current shopping occasion. To understand consumer behaviour, it is necessary to define how each attribute of the consumer setting will interact with the consumer learning history, based on his past experience in similar settings (Foxall, 2001). Situations that signal high probability of each type of consequence will influence the consumer to behave accordingly. In addition to this, consumer scenarios can be classified as open or closed settings, depending on the degree of control that the consumer has over his behaviour and over reinforcement alternatives presented at the time.

Atmospherics as consumer setting

Adopting the BPM as theoretical framework, Foxall and co-workers (Foxall & Greenley, 1999, 2000; Foxall & Yani-de-Soriano, 2005; Soriano & Foxall, 2002; Soriano, Foxall & Pearson, 2006) developed a research agenda for integrating atmospherics phenomena into a consistent behavioural framework. The goal was to provide an alternative and complementary account for atmospheric effects and to indicate more precisely the exact attributes of consumer settings associated with consumer emotional states and actual overt behaviour. Foxall and Greenley (1999) proceeded to correlate different consumer settings with the emotional responses evoked by them, in Mehrabian and Russell's P-A-D terms, and found that environments rich in informational consequences are generally associated with arousal, environments signalling high utilitarian consequences evoke pleasure responses, and the dominance component of the P-A-D model is correlated to the openness of a consumer setting. These results have been replicated (e.g. Foxall & Greenley, 2000; Soriano & Foxall, 2002) and provide a useful way of overcoming one of the strongest limitations of the P-A-D-based models: how to alter consumers' actual overt behaviour. Instead of suggesting a retail manager to avoid creating an exaggerated arousing environment (Foxall & Yani-de-Soriano, 2005), one could investigate the informational consequences signalled by the setting (scent, lighting, background music, indoor decoration; or characteristics of online environment, as in Fagerstrøm, 2010) and then deal appropriately with them. Research on atmospherics phenomena with a BPM orientation allows for the investigation of different behavioural processes involved in the field. Instead of trying to group all phenomena under an emotion-mediated scheme, the behavioural literature suggests several possibilities in which the antecedent events may alter the probability of subsequent behaviour (Forsyth & Eifert, 1996; Whelan & Barnes-Holmes, 2010).

However, there is at least one shortcoming in this line of research. The method usually employed consists in asking for a consumer to imagine a certain consumer setting and then to answer how he would react to this scenario. The systematic results obtained show that this method is indeed very useful (Szpunar, 2010), but limited, since no actual consumer setting is manipulated or presented to participants. Moreover, no effort was invested in discovering the exact attributes or set of attributes signalling informational, utilitarian,

or aversive consequences. Consider the following setting description taken from Foxall (1997), classified as luxury shopping: 'You are wandering from department to department in a store such as Harrods, looking for an expensive treat for yourself which you feel you deserve and which you can well afford' (p. 516, Table 1). For consumers familiarized with Harrods, this scenario should bring about certain feelings and emotional states, but exactly which attributes of this setting is responsible for them remains unknown.

Objectives

The present research aims at developing a methodology for the experimental investigation of atmospherics effects, under a BPM theoretical framework. There is some experimental work in the field reported in the literature (e.g. Michon et al., 2005), but they usually measured only consumers perceptions of the environment as dependent variables and all of them were conducted within a P–A–D framework. The atmospheric variable studied here was quality of background music in a medium-sized mall and a method for determining the precise background music was introduced, inspired by previous studies on consumer behaviour in a different context (Pohl, Oliveira-Castro, Bertoldi, & Souza, 2006). The dependent variables observed were perception of the mall environment, verbal reports on the motives of shopping, and actual buying behaviour measured by the conversion rates and total revenue of participant stores. Another objective of the present research was to assess these possible effects of music quality on two stores differing with respect to informational levels (high versus low). This made possible the investigation of possible interactions between quality of background music and perceived quality of the stores.

Methodology

Procedure

The experiment was conducted in a regional mall, located outside the urban area of Brasília, Brazil, on the 45th, 46th, and 47th week of 2008, at the business hours of the selected mall (from 10 a.m. to 10 p.m.). The mall's sound system was used to play the selected songs. Two stores were selected to participate in this experiment, both selling female clothing and associated products. The selection was based on a previous unpublished research conducted at this same mall that pointed to these stores as having a good flow of consumers and belonging to two different informational levels (Sandall, 2007). The total revenue of participant stores was collected from weekly reports sent by the stores to the mall's administration office. In order to capture the flow and behaviour of consumers inside the mall, two cameras outside the selected stores were installed, allowing the experimenters to count the number of consumers that passed by the store and those who entered the store. To access consumers' perceptions of the mall environment, the motives of their trip to the mall and their perception of time spent at the mall, some consumers were interviewed throughout the day, inside the mall. Consumers were selected by convenience and asked to participate by the mall's research staff.

Accessing consumers' perception of quality of musical genre

During the 36th and 37th week of 2007, selected consumers at the mall indicated what were their musical preference and which musical genre they considered to be of highest quality (of good taste, for the present purposes). This questionnaire was an adaptation of Pohl et al. (2006). The genre considered to be of highest quality, not necessarily the

Table 1. Experimental design of the experiment.

	45th week	46th week	47th week
Background music	Baseline	BM#1	Baseline

Note: During baseline conditions, mall background music was left unchanged.

most preferred, was used as Background Music #1 (BM#1) at the experimental manipulation. On the week before and after the manipulation, mall background music was left unchanged from its normal programme (which included random music as well as periods without any music). Table 1 shows the experimental design. It is important to note that the mall's background music was audible only on the mall's common areas and each store was responsible for its own background music.

Recording consumer behaviour

The video cameras were programmed to record 1 h of uninterrupted activity for each of the odd hours of the business activities. So each of the two cameras recorded 6 h of video per day, from 11:00 to 12:00, 13:00 to 14:00, 15:00 to 16:00, 17:00 to 18:00, 19:00 to 20:00, and 21:00 to 22:00. In order to reduce the material to be analysed and maintain its representativeness, a 'representative hour' of each camera was edited, for each day. A 'representative hour' consisted of six fragments of 10 min randomly selected from each recorded hour. So each camera generated one representative hour per day, summing up 32 h of video for the entire experiment. For this analysis, only data from Tuesdays and Fridays were considered (4 h per week), for these would allow comparisons between busy and weak days, in which different consumers visited the mall.

The videos were used to count the number of consumers who passed by the stores entrance and to calculate the conversion rate 'number of consumers who entered the store divided by the number of those who passed by it' (from here on referred to as CR#1). Consumers that entered the store also counted as passing in front of it, even if they had not passed by the store façade completely. Consumers who were already inside the store at the onset of the recording were not considered, neither were those who entered or passed by the store more than once within the same recording period. The CR#1 was calculated dividing the number of consumers who entered in the store by the number of passant consumers and ranged from 0.00 (in occasions when no consumer entered the stores) to 1.00 (when every consumer passing the store entered).

Questionnaire

During the experiment, consumers were asked to state their perceptions of the mall's environment, their estimates on the time spent in it, and the motives of that shopping trip. This survey was conducted by the mall's research staff based on prior knowledge of hours of highest consumers flow. The questionnaire consisted of 18 questions adapted from Mehrabian and Russell (1974) P-A-D scale plus questions concerning the above-mentioned topics. The adaptation of the P-A-D scale was based on Soriano and Foxall (2002) Spanish translation, which was translated into Portuguese and back-translated into English for conceptual checking. These questions were considered as verbal reports related to the environment, indicating the effect of programmed contingencies, and no attempt was made to validate this scale in Portuguese. As these data were

collected with different consumers than those observed in the video recordings, these two data sets were considered in aggregate.

Results

Selected music genre

To select the highest quality music genre perceived by consumers at the mall, 87 consumers were interviewed and asked to fill out a seven-point scale to record their preferred music genre and the genre they found to be of highest quality ('7' was the most preferred). The results are shown in Table 2.

The scale was adapted from Rentfrow and Gosling's (2003) STOMP scale, adding three Brazilian original genres and replacing two original genres, with a total of 15 musical genres. All genres were positively correlated with each other (r ranged from 0.244 and 0.504), except for Brazilian popular music ($r = 0.204$; $p = 0.059$), for both measures. Classical music, *Sertaneja*,¹ jazz, heavy metal and Brazilian popular music showed significant differences between preference and quality measures ($p < 0.05$).

The most preferred genre was Brazilian popular music and it was also the genre considered to be of the highest quality. There was a statistically significant difference for the perceived quality of Brazilian popular music and religious music, second highest score for quality ($t = 2.627$; $p = 0.01$), and so Brazilian popular music was selected as the background music for the experimental manipulation, BM#1.

In Condition 1, the mall's background music remained unaltered. For the second week of the experiment, Condition 2, only music of BM#1 was played as the background music. In order to access if the music chosen was indeed perceived as Brazilian popular music, excerpts of the chosen music were played to a selected group of workers of the mall administration office and they had to judge which genre that music was, based on the same scale presented to consumers. Only three songs were cut out for not being perceived as belonging to the mentioned genre. For Condition 3, the mall's background music returned to its usual programme.

Table 2. Mean scores for the musical genres in the scale used.

Musical genre	<i>N</i>	Preference	dp	Quality	dp
Classic	87	3.66	2.16	4.32	2.36
Blues	87	3.41	2.10	3.66	2.17
Country	87	3.60	2.26	3.85	2.00
Dance	87	4.32	2.35	4.85	1.93
<i>Sertaneja</i>	87	4.21	2.34	4.71	2.17
Rap	87	3.70	2.36	4.18	2.20
Soul	87	3.85	2.35	3.94	2.94
Religious	87	4.81	2.37	5.38	1.91
Brazilian popular music	87	5.10	2.34	6.11	1.81
Jazz	87	3.63	2.01	4.24	2.03
Rock	87	4.26	2.49	4.08	2.27
Pop	87	4.72	2.16	5.14	1.96
Heavy metal	87	3.02	2.45	2.30	1.90
<i>Forro</i>	87	4.92	2.27	4.94	2.19
<i>Axé</i>	87	4.70	2.42	4.83	2.29

Note: Preference and quality of the genre are shown.

Table 3. Questionnaire data about perception of the mall's environment and shopping information (motivations, estimated shopping time, and background music evaluation).

	Condition 1	Condition 2	Condition 3
Motive of shopping trip			
To know the mall	3% (2)	7% (5)	5% (5)
To stroll	56% (44)	59% (43)	63% (62)
To compare prices	14% (11)	5% (4)	7% (7)
To use the mall services	15% (12)	14% (10)	14% (14)
To lunch/to eat	11% (9)	21% (15)	19% (19)
To buy	22% (17)	14% (10)	23% (23)
Estimated shopping time (min)	88.27 (69.72)	83.03 (53.14)	94.01 (68.7)
Background music evaluation (1 to 10)	7.37 (2.71)	7.64 (2.32)	7.93 (1.98)
Did not perceive background music	21% (17)	27% (20)	15% (15)
Pleasure (SD)	7.15 (1.66)	7.74 (1.24)	7.56 (1.58)
Arousal (SD)	4.78 (1.25)	4.92 (1.33)	4.81 (1.08)
Dominance (SD)	5.91 (1.18)	6.30 (1.34)	6.10 (1.32)

Questionnaire data

During the three conditions of the experiment, 251 consumers were asked to fill out a questionnaire composed of a 18-point scale related to their perceptions of the mall's environment and four questions about the motive of that particular shopping trip, the estimated time of shopping, and about the background music played at the mall (whether they perceived it and, if so, how they evaluated it). The questionnaires were presented at Tuesdays, Fridays, and Saturdays (2 weekdays and 1 weekend day). Table 3 summarizes the data. The data for the three emotional dimensions, pleasure, arousal, and dominance, are shown as the mean scores of the items related to each dimension on the original scale (Mehrabian & Russell, 1974).

For the first part of the questionnaire, the obtained data indicated a homogeneous result across the experimental conditions, with only a few exceptions. In Condition 1, there were more consumers comparing prices and less consumers going to the mall to eat or lunch, and in Condition 2, there were fewer consumers declaring that they were visiting the mall to buy something. Concerning the estimated time spent at the mall, in Condition 2, consumers declared a slightly shorter period of time, which was not significant. The evaluation of the background music followed an increasing trend across conditions, Condition 1 being the worst graded and Condition 3 the best graded. Concerning the perception of background music, in Condition 1 there was the highest number of consumers who did not perceive it, and in Condition 3, only 15% of the consumers declared not having noticed it. As for the perceptions of the mall's environment, all three measures incremented in Condition 2, in relation to Condition 1 and decreased in Condition 3, without, nonetheless, returning to previous levels. These results are shown in Figure 1.

A variance analysis (ANOVA) comparing the three measures with the condition as a factor indicated a marginal significant difference for the measure of pleasure only ($F = 3.018$; $p = 0.051$). A Tukey HSD *post hoc* test shows a significant difference between Conditions 1 and 2, the latter being with the higher mean score ($p = 0.048$) and no difference was found between Conditions 2 and 3.

Video camera data

During the experiment, two video cameras recorded consumers' activities in front of two stores inside the mall. The selected stores were female clothing and associated stores, one

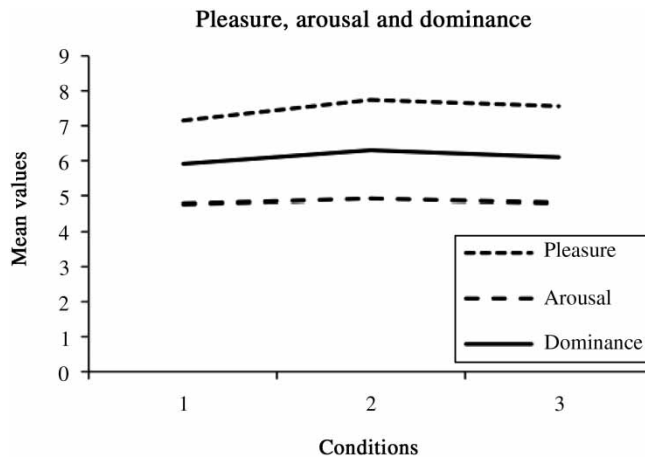


Figure 1. Mean values for the perceptions of the mall's environment as a function of the experimental conditions.

of them offering high informational reinforcement level and the other offering low informational reinforcement level. The video cameras generated data for consumers' flow and conversion rates (the number of consumers passing in front of the store/the number of consumers entering the store). Table 4 shows the data from the video cameras for the three conditions, alongside the declared revenue for both stores.

A Kruskal–Wallis non-parametrical analysis was conducted to detect significant differences across the two stores in the dependent variables measured (i.e. daily revenue, number of consumers passing by the store, and conversion rates). The daily revenue ($\chi^2 = 18.273$, $p = 0.000$; $\chi^2 = 12.750$, $p = 0.000$; $\chi^2 = 18.451$, $p = 0.000$; for Conditions 1, 2, and 3, respectively) and the conversion rates ($\chi^2 = 8.852$, $p = 0.003$; $\chi^2 = 8.521$, $p = 0.004$; $\chi^2 = 13.539$, $p = 0.000$; Conditions 1, 2, and 3, respectively) were significantly different between stores in all conditions, with the high-informational-level store presenting the highest values. For the number of passing consumers, no effect was found in any condition. The same analysis was conducted to investigate the effects of the experimental conditions on those same variables. Table 5 shows these results, for each of the stores.

The results indicate an effect of the experimental conditions on the daily revenue and (marginally) on the conversion rates, with Condition 2 presenting the highest values for daily revenue and the lowest for conversion rate. An additional Mann–Whitney test indicated that the significant difference for both variables was between Conditions 1

Table 4. Daily revenue, number of consumers that passed in front of the store and conversion rates for both stores, in all three conditions.

Condition	High informational level			Low informational level		
	Daily revenue*	Passed	Conversion	Daily revenue*	Passed	Conversion
1	883.00	16.41	0.30	130.00	16.08	0.11
2	1570.00	23.18	0.15	270.00	18.18	0.04
3	920.00	20.41	0.21	240.00	18.08	0.04

*Daily revenue measured as the mean declared revenue on Thursdays and Fridays, in Brazilian Reais (R\$).

Table 5. Kruskal–Wallis non-parametric tests for the mean differences in daily revenue, numbers of passing consumers, and conversion rates between experimental conditions, for both informational level stores.

	Daily revenue*	Passed	Conversion rate
<i>Low-informational-level store</i>			
χ^2	6.044	2.942	5.932
p	0.049	0.230	0.052
<i>High-informational-level store</i>			
χ^2	11.414	0.302	7.468
p	0.003	0.860	0.024

*Daily revenue measured as the mean declared revenue on Thursdays and Fridays, in Brazilian Reais (R\$).

and 2 ($U = 108$, $p = 0.006$ for daily revenue and $U = 141$, $p = 0.007$ for conversion rate). Considering these results, although lesser consumers entered the stores in Condition 2, the daily revenue was higher during this condition, probably because consumers either bought more frequently once inside the store, bought more expensive products (bigger budget), or bought larger quantities.

Discussion

This experiment implemented an original methodology for the investigation of atmospheric phenomena in consumer under a radical behaviourist framework. The novelty of the methodology proposed was the measurement of the quality of the background music, the use of the BPM as a theoretical perspective, and the association of self-reports, observed consumer behaviour, and direct sales metric (as in daily revenue) as a dependent variable. The results obtained indicate the effects of the quality of background music on consumer behaviour in a real-world scenario, decreasing the conversion rates and increasing the daily revenue of participating stores. The results were similar in the two stores as the level of informational reinforcers programmed by each store (high versus low) did not seem to make any difference.

There was no significant difference in shopping motives, estimated shopping time, and background music evaluation across experimental conditions, indicating a rather homogeneous set of consumers interviewed during the experiment. Nonetheless, some effects were found in consumers' verbal reports about the mall's environment. Reports of pleasure were higher during Condition 2 (a statistically significant difference when compared with Condition 1), albeit its very weak effect size ($\eta^2 = 0.04$). As the perception of the shopping mall changed with the manipulation of the background music, it is possible to assume that the music enriched the programmed reinforcement values of the consumer setting. Following the relation proposed by Foxall and Yani-de-Soriano (2005) between Mehrabian and Russell's (1974) three emotional dimensions and the density of utilitarian and informational reinforcement and the openness of a consumer setting in the BPM, the present result indicates that at least some atmospherics effects will work by altering the utilitarian reinforcement signalled by the consumer setting. This was associated with increments in verbal reports of pleasure, but the nature of the association between programmed utilitarian reinforcers and reports of pleasure was not directly investigated and remains an open question. Nevertheless, it is important to note that the effect on the verbal responses observed was small and did not appear in the comparisons between Conditions 2 and 3.

Concerning the effect of the background music on the two stores, it is interesting to note that their difference in informational level (high versus low) was not related to differences in observed results. For both stores, high-quality background music did not affect the number of consumers passing in front of the stores, decreased the conversion rates, and increased the daily revenue declared by the stores. As the increase in revenue was matched with a decrease in conversion rates, the decision to maintain high-quality music in the mall is a delicate one. For the high-informational-level store, it was not a problem, since their revenue is associated with selling more expensive products and their consumer basis is larger (following the pattern in the market, probably consumers of the low-informational-level stores are also their consumers; Ehrenberg, Goodhardt, & Barwise, 1990) as well as their conversion rates. The low-informational-level store may be endangered by the decrease in the conversion rates (in some cases, it fell close to zero), and with the decrease in the number of consumers entering the store, the chances of consumers contacting the stores' prices and products diminish, making it harder for any strategy of elevating their informational level.

Considering that the daily revenue grew in spite of the decrease of conversion rates in Condition 2, it seems reasonable to assume that consumers that did enter the store bought more expensive items (this information was unavailable during the experiment, since the stores only offered their aggregated daily revenue). North and Hargreaves (1998) found similar results on consumer intentions, where atmospherics affected the intention to buy more expensive products. Within the BPM framework, it could be stated that the background music incremented the programmed utilitarian reinforcement of the consumer setting. This conceptualization of utilitarian reinforcers being altered by atmospherics is, by no means, a trivial one. It widens the concept of utilitarian reinforcers as traditionally defined by Foxall (2007) as reinforcers related to the buying, using, and owning of consumer goods. This definition, along with the informational reinforcers definition, seems to parallel that of tangible versus intangible goods often found in the marketing literature, the utilitarian reinforcers being on the side of the tangible attributes of a consumer good. Nonetheless, Foxall and Yani-de-Soriano (2005) already foresaw the possibility of augmenting the pleasure of consumer experience by altering consumer setting attributes, so, as the authors suggest, restaurants could increment their consumers' pleasure not only by manipulating the quality of the meal served, but also by augmenting the quality of the consumer environment.

The increment in the utilitarian value by altering of background music observed in this experiment could be interpreted as motivational operation (in Laraway, Snydersky, Michael, & Poling, 2003, terminology) on the utilitarian reinforcement. A motivational operation is defined as an environmental event that alters the value of a stimulus and, in this way, alters the probability of behaviours associated with its acquisition and the affectivity of stimuli signalling its availability (Whelan & Barnes-Holmes, 2010).² The background music was not related to differential availability of products and in this way cannot be considered a discriminative stimulus in its *stricto sensu* (Millenson, 1967); it was associated with increment in the *value* of the reinforcers. In this way, an atmospheric variable would enhance (or diminish) the utilitarian value of products increasing the probability of behaviours related to its acquisition and the effectiveness of discriminative stimuli signalling its presence. It is possible to hypothesize the existence of motivational operations of informational reinforcement as well and to expect that these operations would, in turn, increase the arousal perceived by consumers. Such a relation between emotional states and contingencies arrangement is not only compatible with the behaviourist interpretation of emotions (see Friman, Hayes, & Wilson, 1998; Skinner, 1959), but also

in line with Foxall and Yani-de-Soriano's (2005) description of dominance as being related to the openness of a consumer setting.

In aligning part of the atmospheric literature with that of motivational operations, much insight is gained. It (a) encourages empirical examination of this interpretation, (b) proposes an agenda for systematic replications, establishing a common theoretical framework for conducting research in the field, and (c) encompasses a strong and empirically sound literature that has been developed for at least three decades on the effects of certain environmental manipulations on the behaviour of organisms. The atmospheric literature is filled with phenomena that, while clearly related to the antecedents of consumer behaviour, are not readily amenable to a discriminative stimulus interpretation. Iwata, Smith, and Michael (2000) state this exact point in a more precise manner: 'Applied researchers have long recognized the fact that antecedent events other than discriminative stimuli can influence the occurrence of operant behaviour; however, the exact nature of that influence and how to call it have been ambiguous throughout much of the field's history'. Perhaps, the proposition presented here will shed some light upon this direction, offering a new way to talk about antecedent events in consumer behaviour analysis.

Managerial implications

This research has direct impact in the way retailers design retail environment and evaluate atmospheric effects. By exemplifying an atmospheric manipulation, from the selection of atmospheric variables to the design of a quasi-experimental method to measure its impact on consumer behaviour and sales metrics, the research suggests a straightforward concept of atmospheric management. This will help retailers to design the store's atmosphere in accordance to consumers' behaviours and sales metrics, focusing on the manipulation of specific reinforcement contingencies. In contrast, the current atmospheric literature often employs environmental variables *assumed* to have an impact on consumer (when there is no previous evaluation of the variable's effect on consumer) and the effects of those variables are often measured by the altering of consumers' verbal reports, usually emotional-related verbal reports. Moreover, the most employed method is correlational, which forbids the assumption of more accurate causal relations between variables investigated. Considering that atmospheric variables may have an important effect on the consumers' choices, their management should be more precise, indicating which kind of environmental stimulus is related to which pattern of consumer behaviour, considering the business activity at hand. In this research, the consumer behaviour at the mall was investigated, so the atmospheric variable chosen was one in effect *at the mall* (i.e. its background music). Once inside the individual stores, the consumers were exposed to a particular shopping atmosphere programmed by the store. It is necessary to further elucidate the effects of these atmospheric variables on the buying behaviour to fully comprehend the servicescape of a mall.

Limitations and future directions

This research investigated a single environmental variable in a single retail environment, that is, the quality of the background music in a regional mall. In order to evaluate the adequacy of the interpretations proposed here, this procedure ought to be investigated in different consumer scenarios and with different atmospheric variables. Some effort should also be made to investigate the interactions of different landscape variables. The experimental design employed (a simple ABA design) was limited by practical

issues and some improvement (more participating stores, more reversal procedures, comparisons between different musical genres, extended periods of data collection, for instance) would allow greater confidence in the results obtained. Nevertheless, the article contributes to the development of a methodology for such replications.

The present research indicated that atmospheric manipulations used seem to have similar effects on different informational-level stores. Some questions should be made regarding their effects upon different utilitarian-level stores or products. Also, there is some debate whether atmospherics would have the same effect on a more closed shopping scenario (i.e. shopping with time pressure or in an environment with less alternatives). The investigation of these variables should enrich the knowledge of the relation between immediate shopping setting and consumer behaviour.

Notes

1. A kind of country music originally from Brazil.
2. The relationship between motivational operations and consumer behaviour is not new and has been detailed in Fagerstrøm, Foxall, and Arntzen (2010).

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