

The role of pleasant music in servicescapes: A test of the dual model of environmental perception[☆]

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Abstract

This article explores the psychological processes by which background music in servicescapes influences service evaluation and purchase intention. Drawing on the dual model of environmental perception, it is hypothesized that: (1) servicescape is perceived in an ambient holistic manner and serves as the background for perceptions of the provider and thereby has direct and provider-mediated effects on outcomes; (2) the presence of music influences outcomes because it reinforces the holistic quality of the servicescape, makes the provider stand out, and moderates the contribution of provider-mediated servicescape effects; (3) when pleasant music is present, a double-mediating process fully accounts for the impact of variations in the music valence, such that music valence gets transferred into servicescape attitude, which then exercises direct and provider-mediated effects on service outcomes. Two experimental studies in real and online environments support the above research hypotheses.

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Introduction

Robust evidence indicates that the presence of music in retail stores and other service environments modulates various facets of the transactions taking place in those environments. However, most prior work examines music as a single environmental parameter and regards its effects as a result of the elicitation and transfer of affects, in line with typical Stimulus-Organism-Response (S-O-R) models that dominate environmental psychology (Mehrabian and

Russell 1974). For example, pleasant music, compared with less pleasant music, is associated with longer consumption times (Caldwell and Hibbert 2002; Herrington and Capella 1996; Holbrook and Anand 1990; Yalch and Spangenberg 2000), shorter time perceptions (Cameron et al. 2003; Kellaris and Kent 1992), less negative emotional reactions to waiting (Hui, Dubé, and Chebat 1997), more favorable attitudes toward the servicescape (Dubé and Morin 2001; North and Hargreaves 1996), an increased desire to affiliate, more positive attitudes toward the provider (Dubé et al. 1995), and more favorable service outcomes like evaluation, patronage intentions and behaviors (Caldwell and Hibbert 2002; Herrington and Capella 1996; Hui, Dubé, and Chebat 1997; North and Hargreaves 1996). Although the bulk of previous research focuses on affective responses to music, studies also have examined objective parameters, such as tempo and volume (Milliman 1982, 1986; Smith and Curnow 1966), and the effect of the presence versus the absence of music per se (Herrington and Capella 1996; Hui et al. 1997; Milliman 1982; North and Hargreaves 1996, 1998; North et al. 2000; Yalch and Spangenberg 1990, 1993).

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Despite evidence that music influences various service components, which combine to shape service outcomes, as well as these outcomes proper, the mechanisms by which music operates remain underresearched. We know very little, for example, about how music as an ambient feature of the environment (Bitner 1992), integrates with space, functions, signs, symbols, and artifacts to shape people's overall holistic perceptions of and responses to physical environments, or servicescapes (Bitner 1990). Moreover, because a service environment entails not only the servicescape but also service providers and other customers as core components of its social dimension (Baker and Cameron 1996; Baker et al. 2002), it is extremely unlikely that simple affect transfer mechanisms – such as from music to service outcomes – provide satisfactory accounts of the psychological processes by which music operates in servicescapes.

Early evidence that the effects of music in servicescapes constitute more than mere affect transfers to service outcomes emerges from a field study by Dubé and Morin (2001). These authors explore the possibility that music pleasantness does not influence store evaluation through a direct affect transfer but alternatively – or complementarily – by first altering consumer attitudes toward the servicescape and service provider, which then influence consumers' store evaluation. Their study finds no support for either a direct affect transfer from music to store evaluation as a whole or the influence of music on attitude toward the provider. Instead, the effect of music on store evaluation is mediated fully by an affect transfer from music to servicescape attitude. In a complex pattern, more pleasant music improves servicescape attitude, which then influences store evaluation both directly and indirectly through its beneficial impact on consumers' attitude toward the provider (i.e., provider attitude), which itself contributes to store evaluation. In addition, follow-up analyses reveal that this second-order mediation of the effects of music by servicescape attitude occurs only among subgroups of participants who report the most positive music valence. When consumers' music valence is low, servicescape attitude has a direct impact on store evaluation and provider attitude, but the latter does not significantly influence store evaluation. However, this study's lack of a control condition (no music) and methodological concerns suggest insufficient experimental control to assess its contribution to a better understanding of how music operates as an ambient feature of the servicescape. In addition, it fails to provide a theoretical explanation of its results beyond asserting that it may be inappropriate to consider on the unique and direct impact of music on service outcomes.

We propose a dual model of environmental perception (Ohno 1980, 1985, 2000; Ohno and Komuro 1984) as a comprehensive theoretical framework to explain the role of music in service environments and the mechanisms by which it affects consumer outcomes. The theoretical underpinnings consist of the combination of two theories: Gestalt theory, which pertains to the perceptual processes of ambient and focal features of the environment (Koffka 1935; Kohler

1929), and Gibson's theory of affordances, which pertains to the motivational characteristics or valence of an environment (Gibson 1966, 1979). According to this dual model, a person's response to an environment as a whole depends on his or her integration of multisensory information, in which ambient features serve as the background for the focal perception of persons or objects, as well as on the valence attached to this integrated whole.

Drawing on this dual model of environmental perception, we suggest that the servicescape, perceived in an ambient holistic manner, serves as the background for perceptions of the provider and thereby has direct and provider-mediated effects on outcomes. We also propose that the presence of music influences outcomes because it reinforces the holistic quality of the servicescape, makes the provider stand out, and moderates the contribution of provider-mediated servicescape effects. Furthermore, instead of direct transfers of affects to service outcomes, we argue that when pleasant music is present, a double-mediating process fully accounts for the impact of variations in the music valence, such that music valence gets transferred into servicescape attitude, which then exercises direct and provider-mediated effects on service outcomes. Finally, in line with research that shows Gestalt perceptions that distinguish between the background and foreground occur not only in perception of physical environments but also in abstract domains, such as perceptions of persons based on list of traits (Asch 1946, 1952), we propose that pleasant music influences service outcomes in an e-environment in a similar manner. We test these hypotheses in two experimental studies conducted in traditional (Study 1) and e-service (Study 2) environments.

Theoretical background and research hypotheses

The dual model of environmental perception

Originally developed through the study of visual perceptions of buildings and landscapes, the dual model of environmental perception (Ohno 1980, 1985, 2000; Ohno and Komuro 1984) accounts for people's inability to process all perceptual information that simultaneously stimulates their sensory channels in an environment (Ittelson 1973, 1976; Ittelson et al. 1974). Furthermore, it posits that a person's response to the environment as a whole depends on his or her integration of multisensory information, which the person processes according to two modes of perception, ambient and focal. *Ambient* perception occurs in a holistic manner and deals with broader areas. It can be considered a preattentive system that warns observers of the key elements that require their attention. *Focal* perception selectively eliminates unwanted information while enhancing those elements to which the person pays attention and increasing their weight for guiding the person's responses to an environment. Although the ambient and focal modes of perception have different functions, they interact to provide a perceptual

synthesis that reflects a person's response to the environment. Borrowing from Gibson's (1966, 1979) affordances theory, the model further posits that the motivational quality of the environment derives from its valence and other aspects of its components. Our research hypotheses, which we present next, stem from this dual model of environmental perception.

Research hypotheses

The mediating role of provider attitude

According to the dual model of environmental perception (Ohno 1980, 1985, 2000; Ohno and Komuro 1984) and the Gestalt theory from which the perceptual part of the model is derived (Koffka 1935; Kohler 1929), perceiving and reacting to an environment requires a person to process certain of its sensory components in an ambient manner while focusing his or her attention on other objects. Both Koffka (1935) and Kohler (1929) argue that the main tenet of Gestalt, regardless of the nature of the experience, is that people view scenes and events as functional wholes. From a Gestalt perspective, the perceiver blends the diverse features of what he or she perceives and responds to into a coherent, unitary impression that combines the meaning of individual components and their interrelationships. Thus, service outcomes result from the integration of the consumer's response to both the servicescape and the provider, in which context the latter is instrumental to fulfill the function of the service transaction.

To address questions regarding the respective and inter-related contributions of the servicescape and the provider to service outcomes, we must theorize about whether each is perceived in an ambient or focal manner. Gestalt theory provides further insights; it states that people organize sensory data according to principles that optimize structural clarity and comprehension (i.e., they read a figure against a ground to impose sensory order). In addition, Gestalt theory suggests that if the environmental conditions can segregate into a larger and a smaller unit, the smaller one, *ceteris paribus*, becomes the figure and the larger the ground. In a typical Gestalt experiment, two areas are laid out such that one encloses the other, so the enclosing one becomes the ground and is processed in an ambient, holistic manner, whereas the enclosed one is the figure and the object of focal processing. Therefore, in a service environment, the physical features that combine to form the servicescape should represent the contextual background, and the service provider should represent the figure or foreground. That is, even though consumer responses to the servicescape and the service provider each may be immediate antecedents of service outcomes (Grace and O'Cass 2004; Nguyen and LeBlanc 2002; Wakefield and Blodgett 1999), the servicescape serves as the background against which providers are perceived. If we assume that a figure's characteristics depend on the ground on which it appears, the effect of the servicescape on outcomes must be mediated, at least in part, by attitude toward the service provider. Therefore, we propose:

H1. The servicescape and service provider are perceived according to ambient and focal modes, respectively, and the former has both direct and provider-mediated effects on service outcomes.

Music as a moderator of provider mediation of servicescape effects

The dual model of environmental perception and Gestalt theory indicate that all experiences – smells, sounds, temperature, textures – occur in one perceptual space, which implies that a person can experience an additional feature only after it is established as part of the person's behavioral environment. Thus, when music functions as an ambient feature in a service environment, it likely gets integrated into the servicescape and is processed in an ambient mode. Because ambient processing has a holistic nature, it does not concentrate or focus on any particular component of the background; thus, when integrated into the servicescape, music fosters connections among and unites the elements in the perceptual organization of the background, which reinforces its ability to highlight the foreground. When perceived against such a holistically integrated background, the service provider stands out better in the foreground than it would were music not integrated. This effect should increase the strength of the provider-mediated effects that the servicescape exercises on service outcomes, primarily by reinforcing the predictive power of the consumer's response to the provider for service outcomes.

Why should the integration of music into the servicescape reinforce this predictive power and increase the strength of the provider-mediated servicescape effects? Research on causal attribution indicates that salience can determine whether a possible cause is actually a cause (Choi and Nisbett 1998; Chua et al. 2005a; Chua et al. 2005b; Morris and Peng 1994). The more salient a possible causal agent is, the more likely it will be perceived as a cause. For example, Jones and Nisbett (1972) rely on Gestalt theory to explain why observers may attribute behavior to personal dispositions rather than to actors; in an observer's perceptual field, the person becomes foregrounded against the background of the social situation. Similarly, a service provider becomes the foreground from the perspective of an observant consumer. Because the service provider stands out even more in the presence of music, this increased salience should strengthen the causal attribution of the role the provider plays in the service outcome. Therefore, we hypothesize that:

H2. The presence (vs. absence) of music has a moderating effect on the mediating role played by the service provider for the impact of the servicescape on service outcomes. Specifically, the power of the provider to influence service outcomes is stronger in a music-present (vs. absent) condition.

Music valence effects on service outcomes and their antecedents

As we mentioned previously, we question whether music valence effects may be accounted for merely by affect transfers from music to service outcomes. Instead, on the basis of

the dual model of environmental perceptions and Gibson's (1966, 1979) theory of affordances, we propose that music valence, when it becomes integrated into the servicescape, signals to the consumer that he or she should approach or distance him- or herself from the service environment, as well as from its physical (servicescape) and social (service provider) components. In this context, the *affordances* conveyed by objects, persons, and the environment as a whole consist of those actions made "affordable" or possible by the same objects, persons, and environment (Gibson 1966, 1979). Although affordances may take different forms, Gibson (1966, 1979) argues that the first level of response to an environment always is affective, such that the direct emotional impact of the situation governs the direction of subsequent relations. That is, it sets the motivational tone and delimits the experiences the consumer expects and seeks. In a precursor to affordances theory (Gibson and Crooks 1938, p. 455), Gibson writes, "By valences, positive or negative, we refer to the meaning of objects by virtue of which we move toward some of them and away from others". We propose music valence in servicescapes operates in a similar way. Specifically, variations in music valence make consumers perceive the servicescape as more or less favorable, which, in accordance with the path of influence suggested by H2, influences service outcomes through both direct and provider-mediated effects. Therefore, we hypothesize:

H3. The effect of music valence on service outcomes is accounted for by a double mediation, such that the effect of music valence on service outcomes is mediated by: (a) the direct effect of the servicescape and (b) the provider-mediated effect of the servicescape on service outcomes.

Study 1

Overview

Study 1 involves a laboratory experiment with video simulations of a retail banking service that were constant across conditions except for the background music. Participants role played a protagonist from whose perspective the video was shot and reported their perceptions regarding their attitudes toward the servicescape and provider, as well as their evaluations of the service episode as a whole. When background music was present, participants also reported its valence. Several studies of service environments show this methodological approach to be effective and have good ecological validity (e.g., Baker et al. 2002; Bateson and Hui 1992; Dubé et al. 1995).

Method

Participants

We recruited students and employees of an eastern North American university with ads placed in the university's news-

paper inviting participation in a study on consumer behavior in the service industries. One hundred fifty-three adults (96 women, 57 men; average age 26.4 years, ranging from 19 to 67 years) participated in the experiment and took part in a prize drawing.

Experimental design and stimuli

The experimental design compares music presence to a baseline or no-music control condition and ensures sufficient valence variability in the music-present condition with a trilevel blocking factor of low, moderate, and high intensity. The musical excerpts used as background music for each music blocking level consist of classical pieces selected from a pool originally developed by Dubé et al. (1995). Using a population similar to that of the study participants, we pretested these musical excerpts in terms of the scope of valence intensity they elicited (means of 3.29, 4.71, and 6.16, all $ps < .05$) while controlling for tempo, rhythm, harmony, and mode as determined by a musical expert. We present a detailed description of the pretest procedures and results in Appendix A.

Music played as background to the same baseline 3.5-min video of a bank transaction between a service provider and a customer at the cashier's counter. The film was shot by professionals in a real bank from the perspective of someone looking around while waiting in line to be served and observing the provider–customer interaction at the counter. The video included images of the physical environment and the interaction between the cashier and the current customer, then ended as the protagonist, as role played by the participant, was about to be served. The recorded background music played at the same comfortable volume level throughout the experiment. Subjects rated the scenarios as fairly consistent with reality (mean of 5.08), similar to their previous life experiences (mean of 4.96), realistic (mean of 5.09), and providing the impression of being in line (mean of 5.06) on seven-point scales (not at all/very much). We find no differences across experimental conditions (all $ps > .40$).

Experimental procedure and measures

Participants viewed the experimental video on a television screen in a quiet room with basic daytime lighting conditions. They participated in small groups of two to five unacquainted respondents and were instructed not to interact during the session. In line with prior research using video simulations, they were told to imagine themselves in a bank environment waiting in line to be served. At the end of the video, participants completed a printed questionnaire about the servicescape and provider attitudes, and service evaluation.

Participants expressed their attitude toward the physical environment (servicescape) on a three-item, seven-point scale, anchored by like not at all/very much, unpleasant/pleasant, and disagreeable/agreeable (Cronbach's $\alpha = .94$). We borrowed these items from attitude measures in advertising research (Gorn 1982). We compute the individual average scores for use in our subsequent analyses. For

Table 1
Correlations and means (standard deviations) of measured variables: Studies 1 and 2

	1	2	3	4
1. Music valence		.48 ^a 3.76 (1.36)	.29 ^a 3.56 (1.56)	.29 ^a 3.44 (1.45)
2. Servicescape attitude	.46 ^a 5.41 (1.26)		.49 ^a	.47 ^a
3. Provider attitude	.20 5.61 (1.38)	.42 ^a		.69 ^a
4. Service evaluation/Purchase intention	.35 ^a 3.91 (1.78)	.62 ^a	.47 ^a	

Notes. Study 1 correlations and means (standard deviations) appear above the diagonal; Study 2 correlations and means (standard deviations) appear below the diagonal.

^a Correlation is significant at the .01 level.

their attitude toward the service provider, participant used the same scale (Cronbach's $\alpha = .94$). We again compute individual average scores and use them in our subsequent analyses. Participants also provided their overall assessment of the service quality provided by the bank (single-item, seven-point scale, very poor/very high service quality; Bolton and Drew 1991). Finally, participants in each background music condition reported the valence of their subjective experience tied to music on a two-item, seven-point scale: unpleasant/pleasant and made me feel bad/good (Cronbach's $\alpha = .97$).

Results

We provide the descriptive statistics and correlation coefficients of the measured variables in Table 1. All measures demonstrate adequate variability, and none evidence floor or ceiling effects. The valence intensity reported by participants in the main study covers the full distribution spectrum (mean = 3.83, $SD = 1.94$, median = 3.50, min = 1.0 and max = 7.0), as we show in Fig. 1.

Servicescape direct and provider-mediated effects on service outcomes

To test H1, we examine whether provider attitude mediates some of the effect of servicescape attitude on service evaluation across all participants. As recommended by Baron and Kenny (1986), to test for mediation, we conduct a three-step regression analysis. In the first step, we regress provider attitude (mediator) on servicescape attitude (predictor). In the second step, we regress service evaluation (outcome) on servicescape attitude. Finally, in the third step, we regress service evaluation on both servicescape and

provider attitudes. We present the results from this set of analyses in Table 2, which shows that servicescape attitude significantly influences provider attitude ($\beta = .46, p < .001$) and service evaluation ($\beta = .47, p < .001$). When we enter both servicescape and provider attitudes as predictors, provider attitude significantly affects service evaluation ($\beta = .59, p < .001$), whereas the effect of servicescape attitude decreases (Sobel test, $t = 5.23, p < .001$) but remains significant ($\beta = .20, p < .01$), indicating a partial mediation. In addition, we observe an increased change in the R^2 value when we regress two predictors on service evaluation rather than only one (R^2 values of .22 vs. .50; $F[1, 151] = 43.13, p < .001$ vs. $F[2, 144] = 75.50, p < .001$ for the models with one vs. two predictors, respectively). Thus, we find support for H1.

The moderating role of music presence on provider mediation

H2 proposes that the presence (compared with absence) of music has a moderating effect on the mediating role played by the provider in the impact of the servicescape on service evaluation. Following Baron and Kenny (1986), as well as more recent specifications of analytical approaches to moderated mediation (Muller et al. 2005), we test H2 with a two-phase analytical strategy. We first test the significance of the moderating effect of music presence by defining an interaction between a dichotomous variable (presence vs. absence of background music) and the significance of the difference between the direct effects of service provider and servicescape attitudes on service outcomes. Next, using mediational analyses conducted separately for the music-present and music-absent conditions, we examine the directionality of the moderating effect of music presence on the mediating processes observed in our investigation of H1 by conducting these analyses separately for the music and no-music conditions and comparing their relevant parameter estimates. We present the results of these two sets of analyses in detail in the lower panel of Table 2. We first review the results that bear directly on our hypothesis testing and then report the details of the mediational analyses for each condition.

In support of H2, the results from our first phase of analysis show that the presence of music moderates the immediate impact of provider attitude on service evaluation ($t = 1.90, p = .06$). Separate analyses for the music present and absent conditions confirm that the presence of music strengthens this relationship ($B = .72/\beta = .63$ vs. $B = .42/\beta = .45$ for music present vs. absent). We also examine the relative power of servicescape and provider attitudes as immediate antecedents of service evaluation in the music and no-music conditions. In the absence of music, both service components

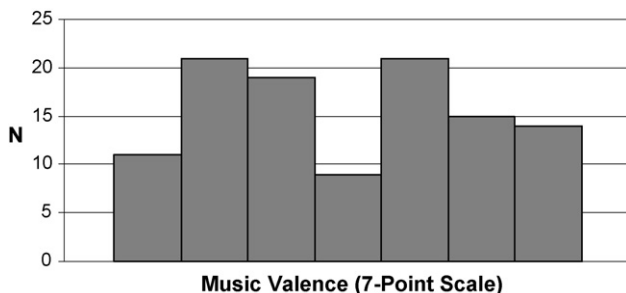


Fig. 1. Histogram of music valence distribution: Study 1.

Table 2
Mediational analysis of the effects of servicescape on service evaluation: Study 1

		Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>p</i>	Model statistics
		<i>B</i>	SE	β			
Overall (<i>n</i> = 153)							
1; M = X	Constant	.19	.27	–	6.82	.000	$R^2(1, 150) = .22$
	Servicescape	.44	.07	.46	6.41	.000	$F = 41.03, p < .001$
2; Y = X	Constant	1.64	.29	–	5.71	.000	$R^2(1, 151) = .22$
	Servicescape	.47	.07	.47	6.57	.000	$F = 43.13, p < .01$
3; Y = XM	Constant	.42	.27	–	1.59	.114	$R^2(2, 144) = .50$
	Servicescape	.20	.07	.20	3.11	.002	$F = 75.50, p < .01$
	Provider	.63	.07	.59	9.10	.000	
No music (<i>n</i> = 43)							
1; M = X	Constant		.55	–	1.49	.143	$R^2(1, 41) = .40$
	Servicescape	.73	.14	.64	5.26	.000	$F = 27.70, p < .001$
2; Y = X	Constant	.91	.52	–	1.77	.084	$R^2(1, 41) = .40$
	Servicescape	.67	.13	.63	5.22	.000	$F = 27.27, p < .001$
3; Y = XM	Constant	.57	.48	–	1.18	.244	$R^2(2, 40) = .52$
	Servicescape	.37	.15	.35	2.45	.019	$F = 21.63, p < .001$
	Provider	.42	.13	.45	3.16	.003	
Music (<i>n</i> = 110)							
1; M = X	Constant	2.20	.31	–	7.10	.000	$R^2(1, 107) = .16$
	Servicescape	.35	.08	.40	4.45	.000	$F = 19.80, p < .001$
2; Y = X	Constant	1.87	.34	–	5.45	.000	$R^2(1, 108) = .17$
	Servicescape	.41	.09	.42	4.75	.000	$F = 22.56, p < .001$
3; Y = XM	Constant	.25	.33	–	.77	.441	$R^2(2, 106) = .51$
	Servicescape	.17	.07	.17	2.36	.020	$F = 55.97, p < .001$
	Provider	.72	.08	.63	8.54	.000	

Notes. X = servicescape, Y = service evaluation, and M = provider.

are equally powerful immediate antecedents of service evaluation ($\beta = .45, p < .02$ and $\beta = .35, p < .01$; $t = .23, p > .10$); however, in the presence of background music, the power of provider attitude as an immediate antecedent surpasses that of servicescape attitude ($\beta = .63, p < .001$ vs. $\beta = .17, p < .05$; $t = 2.21, p < .02$). This finding is consistent with the strengthening of the provider–outcome relationship we propose in H2.

Turning to the mediational analyses for each music condition, we find that in the absence of music, servicescape attitude significantly influences provider attitude ($\beta = .64, p < .001$) and service evaluation ($\beta = .63, p < .001$). In turn, provider attitude represents a significant antecedent of service evaluation ($\beta = .45, p < .01$), and when entered as a second predictor, the effect of servicescape attitude on service evaluation diminishes significantly ($\beta = .35, p < .02$), as indicated by the results of a Sobel test ($t = 2.71, p < .01$). Also, we observe an increased change in the R^2 value when we regress two predictors on service evaluation as opposed to only one (R^2 values of .40 vs. .52; $F[1, 41] = 27.27, p < .001$ vs. $F[2, 40] = 21.63, p < .001$, one vs. two predictors, respectively).

In the presence of music, servicescape attitude significantly influences provider attitude ($\beta = .40, p < .001$) and service evaluation ($\beta = .42, p < .001$). In turn, provider attitude represents a significant antecedent of service evaluation ($\beta = .63, p < .001$), and when entered as a second predictor, the effect of servicescape attitude on service evaluation diminishes significantly ($\beta = .17, p < .02$), as indicated by the results of a Sobel test ($t = 3.92, p < .001$). This finding indicates partial mediation. We also observe an increased change in the R^2 value when we regress two predictors on service evaluation as opposed to only one (R^2 values of .17 vs. .51; $F[1, 108] = 22.56, p < .001$ vs. $F[2, 106] = 55.97, p < .001$, one vs. two predictors, respectively).

In addition, we conduct a post hoc analysis to examine the relative proportion of the total effect of servicescape attitude on service evaluation, as mediated by provider attitude, in the music and no-music conditions. We calculate the relative contribution of provider mediation to the total effect of servicescape attitude on service evaluation, in line with Judge et al. (2006). Our results reveal that, in the absence of music, 45.1 percent of the standardized total effect of the servicescape on service evaluation ($\beta = .63$) is mediated by provider attitude ($\beta = .29$ and $\beta = .35$ for indirect and direct effects, respectively). In contrast, in the presence of music, 59.8 percent of the standardized total effect of the servicescape on service evaluation ($\beta = .42$) is mediated by provider attitude ($\beta = .25$ and $\beta = .17$ for indirect and direct effects, respectively). In conclusion, provider mediation accounts for a greater proportion of the total effect of servicescape attitude on service evaluation in the music, compared with the no-music, condition ($z = -1.65, p < .05$).

Music valence effects

The results we have presented thus far indicate that the direct and provider-mediated effects of servicescape attitude on service evaluation vary as a function of the presence or absence of background music. H3 also states that, in the presence of background music, the effect of variations in music valence on service outcomes can be accounted for fully by a double mediation centered on the integration of music valence into servicescape attitude. In testing H2, we already have examined the direct and provider-mediated indirect effects of servicescape on service evaluation for participants in the music condition; to test H3, we perform two additional sets of analyses with these participants. First, we test whether the effect of music valence on service evaluation is mediated by the direct effect of servicescape attitude on the same outcome. Second, we exam-

Table 3

Regression analysis of mediating role of servicescape in the effects of music valence on service evaluation and provider attitude: Study 1

		Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>p</i>	Model statistics
		<i>B</i>	SE	β			
Music; service evaluation (<i>n</i> = 110)							
1; M = X	Constant	2.30	.28	–	8.22	.000	$R^2(1, 108) = .23$
	Music	.37	.07	.48	5.61	.000	$F = 31.45, p < .001$
2; Y = X	Constant	2.54	.30	–	8.46	.000	$R^2(1, 108) = .09$
	Music	.22	.07	.29	3.20	.002	$F = 10.24, p < .01$
3; Y = XM	Constant	1.73	.36	–	4.76	.000	$R^2(2, 107) = .19$
	Music	.10	.08	.13	1.26	.210	$F = 12.14, p < .001$
	Servicescape	.35	.10	.36	3.59	.000	
Music; provider attitude (<i>n</i> = 110)							
1; M = X	Constant	2.30	.28	–	8.22	.000	$R^2(1, 108) = .23$
	Music	.37	.07	.48	5.61	.000	$F = 31.45, p < .001$
2; Y = X	Constant	2.72	.27	–	10.12	.000	$R^2(1, 107) = .09$
	Music	.20	.06	.29	3.18	.002	$F = 10.08, p < .01$
3; Y = XM	Constant	2.05	.33	–	6.26	.000	$R^2(2, 106) = .17$
	Music	.09	.07	.14	1.39	.167	$F = 10.96, p < .001$
	Servicescape	.29	.09	.33	3.30	.001	

Notes. X = music valence, Y = service evaluation/provider, and M = servicescape.

ine whether servicescape attitude plays a similar mediating role in accounting for the effects that music valence may have on provider attitude. According to Kenny (2006), such first- and second-order mediational analyses are typical in studies with limited sample sizes (e.g., Morgeson et al. 2005; Stuart and Holtzworth-Munroe 2005). We present our results from these analyses in Table 3.

The results from the first set of analyses, examining the mediating role of servicescape attitude in the impact of music valence on service evaluation, reveal that valence is a significant predictor of servicescape attitude ($\beta = .48, p < .001$) and service evaluation ($\beta = .29, p < .01$). When both servicescape and music valence serve as predictors of service evaluation, servicescape attitude significantly influences service evaluation ($\beta = .36, p < .01$), but the music valence effects diminish (Sobel test, $t = 3.02, p < .01$) and shift to insignificance ($p > .20$). In addition, we observe an increased change in the R^2 value when we regress two predictors on service evaluation as opposed to only one (R^2 values of .09 vs. .19; $F[1, 108] = 10.24, p < .01$ vs. $F[2, 107] = 12.14, p < .001$, one vs. two predictors, respectively).

From our analyses of the mediating role of servicescape attitude in valence effects on provider attitude, we find that music valence significantly influences servicescape ($\beta = .48, p < .001$) and provider ($\beta = .29, p < .01$) attitudes. Servicescape attitude in turn influences provider attitude ($\beta = .33, p < .001$), and when we add it to music valence as a predictor, the pleasure coefficient diminishes (Sobel test; $t = 2.85, p < .01$) to insignificance ($p > .15$). We again observe an increased change in the R^2 value when we regress two predictors on provider attitude as opposed to only one (R^2 values of .09 vs. .17; $F[1, 107] = 10.08, p < .01$ vs. $F[2, 106] = 10.96, p < .001$, one vs. two predictors, respectively). Thus, for both service evaluation and provider attitude, music valence effects are fully mediated by their integration into servicescape attitude, in support of both H3a and H3b.

Although testing for mediation using a sequence of three separate regression equations, in accordance with Baron and Kenny's (1986) approach (Kenny 2006; Muller et al. 2005), enables us to test the significance of the different parameter estimates, it does not allow us to examine the simultaneous effects of the indepen-

dent variables. To test the model simultaneously, we use EQS (version 6.1 for Windows; Bentler 1995) and find good fit indices (Bentler–Bonett normed index [BBNI] = .97; Bentler–Bonett non-normed index [BBNNI] = .99; comparative fit index [CFI] = 1.00, $\chi^2 = 25.27$, with 22 *df*, $p = .27$; residuals distribution: average absolute = .02, average off-diagonal = .03; distribution symmetric and zero centered). The results (see Fig. 2) show that music valence influences service evaluation according to the following path: more pleasurable music adds to servicescape attitude in a valence-congruent manner (standard parameter = .51, $z = 5.23, p < .001$), which in turn improves provider attitude (standard parameter = .35, $z = 3.11, p < .01$), which then has a powerful influence on service evaluation (standard parameter = .66, $z = 7.72, p < .001$). In addition, more positive servicescape attitude has a marginally significant direct effect on service evaluation (standard parameter = .14, $z = 1.62, p = .10$). We do not observe any direct effect of music valence on provider attitude or service evaluation. In summary, the results of both our mediational and our structural analyses, as presented in Fig. 2, are almost identical.

We further examine whether the observed mediated processes underlying music valence effects induce differences in the mean values of the measures. To this end, we form a posteriori subgroups, on the basis of a median split, of background music participants who varied in their reports of music valence intensity (means of 2.24 and 5.73, $t[108] = -21.60, p < .001$ for low- and high-music valence intensity subgroups, respectively), then compare the two groups. Our analyses reveal that participants for whom the music induces a more pleasurable experience, compared with those who experience less intense pleasure, report more positive servicescape attitude (means of 4.39 and 3.12 for high and low pleasure, $t[108] = -4.89, p < .001$), more positive provider attitude (means of 3.87 and 3.17, $t[108] = -2.95, p < .001$), and more favorable service evaluation (means of 3.78 and 3.07, $t[108] = -2.60, p < .01$).

Discussion

The results from Study 1 support the predictions derived from the dual model of environmental perception. That is,

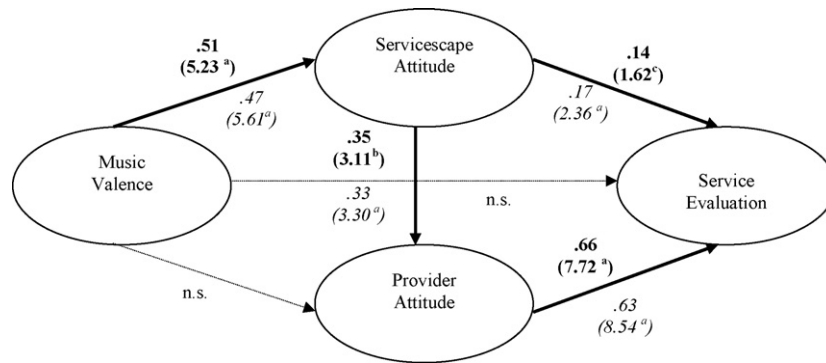


Fig. 2. Music valence effects on service evaluation—results from mediational analyses and structural modeling: Study 1. Notes. Mediational analyses are in *italics* and structural modeling in bold. ^a $p < .001$; ^b $p < .01$; ^c $p = .10$.

the effect of servicescape on service evaluation is partly mediated by provider attitude, and the presence of music reinforces the contribution of these provider-mediated servicescape effects to service evaluation. The overall increase in provider-mediated servicescape effects is driven primarily by an increase in the strength of provider attitude as an antecedent of service evaluation. In fact, the increase in provider-mediated servicescape effects occurs in spite of the fact that the coloring effect of servicescape attitude on provider attitude is diminished by the presence of music, as is indicated by the significant interaction between this parameter estimate and the dichotomous variable defined by music presence ($t = 2.43, p < .02$). When music is present, the impact of its valence on service evaluation is fully accounted for by the proposed double-mediating process, in which music gets integrated into the consumer's response to the servicescape, which then exercises a direct and provider-mediated effect on service evaluation. Moreover, music valence, when it is not integrated into servicescape attitude, fails to influence either provider attitude or service evaluation directly. This null result replicates Dubé and Morin's (2001) and Baker and colleagues' (2002) null results for such provider attitude relationships, as well as Dubé and Morin's (2001) finding of a lack of music effect on service outcomes (i.e. store evaluation).

Study 2

Because the results from Study 1 generally support our predictions derived from the dual model of environmental perception for the effect of music as an environmental, physically perceived parameter in a service environment, we argue it also is relevant to examine whether these results apply in an e-environment, in which other physical components are reduced to the flat sensory field of computer space. Pleasant music may operate in the same manner to influence service outcomes in an e-environment, because Gestalt perceptions that contain background/foreground differentiation have been observed not only in the perception of physical environments but also in abstract domains (Asch 1940, 1946,

1952). For example, subjects do not attribute the same meaning to the quality of being "intelligent" when they judge it against a background of the same person as warm-hearted (i.e., wise) versus an alternative background of the person as cold (i.e., calculating) (Asch 1946). Similarly, in addition to its sensorial diversity and immediacy, a service environment may integrate a broader context (whether physical or virtual) in which the service provision is embedded. In this case, background/foreground distinctions between the e-servicescape and the e-provider still may exist, which would mean that the same set of psychological mechanisms observed for traditional services would apply.

Study 2 also addresses some of the limitations of Study 1. First, in Study 1, the measure we use for service evaluation is a single time measure of service quality. Second, the range of variation in valence intensity in Study 1, which includes negative valence, may not represent actual practice, because no manager would purposefully choose music that people dislike as the background to a service environment. Therefore, in Study 2, we examine whether the dual model of environmental perception supports a more realistic variation in valence intensity and use that to induce either moderate or intense pleasure. Third, even though the use of video simulation in research on consumer responses to service environments has been proven ecologically valid (Bateson and Hui 1992), we want to examine whether our proposed model might be stronger with an experimental design that combines the rigor of laboratory experiments with an actual service experience in which participants are both exposed to the experimental manipulation of background music and experience the service provision process themselves instead of through video simulation. In Study 2, participants engage in an exchange with providers in different music conditions.

Overview

With Study 2, we attempt to reproduce, as accurately as possible, an actual e-service experience in a controlled laboratory environment and create experimental conditions similar to Study 1—namely, the presence versus absence of

music and a blocking factor to ensure the variability of the music valence, albeit with a more limited scope. The e-service firm is an existing retail store with online catalog sales services that was relatively unknown to the study population. For the purpose of our study, the store added a chat room to its Web catalog to offer the services of an online service provider who interactively assisted the participant in purchasing a gift for his or her friend through real-time exchanges via MSN Messenger, version 6.2. As in Study 1, all participants reported their servicescape and provider attitudes, as well as their purchase intention as a measure of service outcomes. Participants in the music conditions also provided ratings of music valence.

Method

Participants

We recruited one hundred thirty adults (68 women, 62 men; average age 26.9 years) from a major North American city with ads placed in a local newspaper that invited people to participate in a study on consumer behavior on the World Wide Web. Participants received CAN\$15 as a token of appreciation for completing the experimental session, which lasted an average of 45 min. Overall, the participants had a high level of experience with the Web or Internet (mean of 5.85 on seven-point scale, not at all/very much) and online chatting (mean of 4.55). They also reported shopping online to a moderate degree (mean of 3.24). Most had never heard of the service firm used in this study (74.6 percent) or visited its brick-and-mortar outlets (89.2 percent). None of the participants reported ever visiting the experimental Web site before.

Experimental design and stimuli

Similar to Study 1, we use an experimental design that compares a no-music to a music condition, which we designed to ensure sufficient variability in the valence of musical excerpts according to a bilevel blocking factor (i.e., moderate and high). We selected the musical excerpts on the basis of a pretest similar to the one we used for Study 1, but this time, the music, from Stéphane Pom-pougnac CDs (*Hôtel Costes*, *Saks Fifth Avenue*, and *Hôtel Costes 5*), was of a type more frequently encountered as background music in service firms. Using a population similar to the participants in Study 2, we pretested musical excerpts to obtain two CD-recorded music tracks that varied in the intensity of their valence (means of 4.29 and 5.55 on seven-point scale, $t[18.45] = -2.40$, $p < .05$) while controlling for tempo, as determined by objective measures, and familiarity, as determined by subjects' evaluations. We provide the detailed procedures and results for this pretest in Appendix B.

Experimental procedure and measures

Participants progressed through the experimental procedure one step at a time. They first looked through the

experimental Web site and browsed the Internet catalog with the objective of finding a gift for their best friend. The Web site featured primarily decorative objects, items for the kitchen, furniture, lighting, bathroom items, office accessories, and other gadgets. After the participants finished browsing the Web site by themselves, they communicated via chat exchanges with the online service provider, who assisted them on a real-time basis in finding a gift for their best friend. The online provider's suggestions were based on customized information provided by the participants about particular characteristics of their best friend, the type of gift they wanted or both. The online advisor had access to a matrix of selective product offerings developed and pretested to assist her. The same experimenter, who was blind to the participants' experimental conditions, offered online advice to all participants. During the entire experimental session (i.e., both individual exploration and provider exchanges), the Web site broadcast background music in the music conditions and remained silent in the baseline, no-music condition.

Except for service evaluation, the measures in this study are the same as those in Study 1. However, we measure service outcomes in terms of purchase intention on a four-item scale adapted from Eroglu et al. (2001): "Given a choice, I would probably not go back and visit this website again," "I would definitely recommend this website to other people," "I would definitely add this website to my favorites", and "I would definitely go and visit one of their stores in the future" (seven-point scale; not at all/very much; Cronbach's $\alpha = .86$). We compute individual average scores and use them in the analyses.

Results

We present the means, standard deviations, and correlations of the measures from Study 2 in the lower diagonal of Table 1. The valence intensity reported by participants in the main study includes sufficient variability and covers the spectrum of the distribution, ranging from moderate to high valence intensity (mean = 5.21, $SD = 1.51$, median = 5.71).

Mediating role of provider attitude in servicescape effects

We use the same analyses as in Study 1 to examine whether provider attitude mediates some of the effect of servicescape attitude on purchase intention. As we show in the upper panel of Table 4, these analyses reveal that servicescape attitude significantly influences provider attitude ($\beta = .42$, $p < .001$) and purchase intention ($\beta = .62$, $p < .001$). When we enter both servicescape and provider attitudes as predictors, provider attitude significantly affects purchase intention ($\beta = .25$, $p < .01$), whereas the effect of servicescape lessens (Sobel test: $t = 5.23$, $p < .001$) but remains significant ($\beta = .52$, $p < .001$), indicating partial mediation. In addition, we observe an increased change in the R^2 value when we regress two predictors on purchase intention as opposed to only one (R^2 values of .39 vs. .44; $F[1, 128] = 80.48$, $p < .001$ vs. $F[2, 127] = 49.45$, $p < .001$, one vs. two predictors, respectively). Thus, H1 is supported.

Table 4
Mediational analyses of the effects of servicescape on purchase intention: Study 2

		Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>p</i>	Model statistics
		<i>B</i>	SE	β			
Overall (<i>n</i> = 130)							
1; M = X	Constant	3.40	.43	–	7.82	.000	$R^2(1, 128) = .17$
	Servicescape	.42	.08	.42	5.17	.000	$F = 26.69, p < .01$
2; Y = X	Constant	–.02	.46	–	–.03	.974	$R^2(1, 128) = .39$
	Servicescape	.77	.09	.62	8.97	.000	$F = 80.48, p < .001$
3; Y = XM	Constant	–1.06	.54	–	–1.97	.051	$R^2(2, 127) = .44$
	Servicescape	.65	.09	.52	7.07	.000	$F = 49.45, p < .001$
	Provider	.31	.09	.25	3.42	.001	
No music (<i>n</i> = 38)							
1; M = X	Constant	3.55	.94	–	3.76	.001	$R^2(1, 36) = .12$
	Servicescape	.38	.17	.35	2.24	.032	$F = 5.00, p < .05$
2; Y = X	Constant	–1.66	.89	–	–1.87	.070	$R^2(1, 36) = .53$
	Servicescape	1.03	.16	.73	6.42	.000	$F = 41.19, p < .001$
3; Y = XM	Constant	–2.33	1.05	–	–2.23	.032	$R^2(2, 35) = .55$
	Servicescape	.96	.17	.68	5.63	.000	$F = 21.56, p < .001$
	Provider	.19	.16	.14	1.20	.239	
Music (<i>n</i> = 92)							
1; M = X	Constant	3.33	.49	–	6.77	.000	$R^2(1, 90) = .20$
	Servicescape	.44	.09	.44	4.70	.000	$F = 22.06, p < .001$
2; Y = X	Constant	.47	.53	–	.87	.386	$R^2(1, 90) = .35$
	Servicescape	.70	.10	.59	6.91	.000	$F = 47.78, p < .001$
3; Y = XM	Constant	–.76	.62	–	–1.22	.226	$R^2(2, 89) = .42$
	Servicescape	.54	.11	.45	5.04	.000	$F = 32.43, p < .001$
	Provider	.37	.11	.31	3.39	.001	

Notes. X = servicescape, Y = purchase intention, and M = provider.

Moderating role of music presence on provider mediation

As in Study 1, we conduct analyses with dummy variables to test the moderating role of music on the preceding relationships, followed by analyses conducted separately according to the music condition. We present the results in the lower panel of Table 4. In line with H2, the parameter for the relationship between provider attitude and purchase intention differs between the music and no-music conditions ($t = -1.97, p < .05$). Also consistent with H2, the presence of music strengthens the impact of provider attitude on purchase intention ($B = .37/\beta = .31$ vs. $B = .19/\beta = .14$ for music vs. no-music conditions, respectively). As in Study 1, we examine the relative power of servicescape and provider attitudes as immediate antecedents of purchase intention in the music and no-music conditions. This time, in both the presence and absence of music, the power of provider attitude as an immediate antecedent of purchase intention is inferior to that of servicescape (music absent, $\beta = .14, p > .20$ vs. $\beta = .68, p < .001; t = 3.34, p < .002$; music present, $\beta = .31, p < .001$ vs. $\beta = .45, p < .01; t = 1.31, p = .09$). However, the predictive power differential between servicescape and provider attitudes is three times smaller when music is present versus absent. Thus, though in a weaker manner than in Study 1, we again find support for H2 and argue that the presence of music strengthens the provider–outcomes relationship.

With regard to the mediating processes observed for the music and no-music conditions, we find that, in the absence of music, servicescape attitude significantly influences provider attitude ($\beta = .35, p < .05$) and purchase intention ($\beta = .73, p < .001$). However, provider attitude in the absence of music in the e-environment of Study 2 fail to influence purchase intention ($p > .20$), which suggests that the effects of servicescape attitude on purchase

intention are mediated by provider attitude. We observe no change in the R^2 value when we regress two predictors on purchase intention as opposed to only one (R^2 values of .53 vs. .55; $F[1, 36] = 41.19, p < .001$ vs. $F[2, 35] = 21.56, p < .001$).

In the presence of music, servicescape attitude significantly influences provider attitude ($\beta = .44, p < .01$) and purchase intention ($\beta = .59, p < .001$). In turn, provider attitude offers a significant antecedent of purchase intention ($\beta = .31, p < .01$), and when entered as a second predictor, the effect of servicescape attitude on purchase intention diminishes according to the results of the Sobel test ($t = 2.76, p < .01$), but it remains significant ($\beta = .45, p < .001$). Moreover, we observe an increased change in the R^2 value when we regress two predictors on purchase intention as opposed to only one (R^2 values of .35 vs. .42; $F[1, 90] = 47.78, p < .001$ vs. $F[2, 89] = 32.43, p < .001$ for one vs. two predictors, respectively).

As we did for Study 1, we conduct a post hoc analysis to examine the relative proportion of the total effect of servicescape attitude on purchase intention that is mediated by provider attitude in the music and no-music conditions. Then, we calculate the relative contribution of provider mediation to the total effect of servicescape on purchase intention for the music condition only (we observe no indication of provider mediation in the absence of music). While no mediation is found in the absence of music, when it is present, 23 percent of the standardized total effect of servicescape attitude on purchase intention ($\beta = .59$) is mediated by provider attitude (indirect $\beta = .14$; direct $\beta = .45$). This post hoc analysis implies that provider mediation accounts for a larger proportion of the total servicescape effects on purchase intention in the music condition than in the no-music condition ($z = -5.73, p < .001$).

Table 5
Regression analysis of the mediating role of servicescape on the effects of music valence on purchase intention and provider attitude: Study 2

		Unstandardized coefficients		Standardized coefficients	t	p	Model statistics
		B	SE	β			
Music; purchase intention (n = 92)							
1; M = X	Constant	2.99	.45	–	6.63	.000	R ² (1, 90) = .21
	Music	.40	.08	.46	4.84	.000	F = 23.43, p < .001
2; Y = X	Constant	2.13	.57	–	3.75	.000	R ² (1, 90) = .12
	Music	.37	.10	.35	3.52	.001	F = 12.36, p < .01
3; Y = XM	Constant	.19	.60	–	.32	.751	R ² (2, 89) = .36
	Music	.11	.10	.10	1.05	.296	F = 24.47, p < .001
	Servicescape	.65	.11	.54	5.68	.000	
Music; provider attitude (n = 92)							
1; M = X	Constant	2.99	.45	–	6.63	.000	R ² (1, 90) = .21
	Music	.40	.08	.46	4.84	.000	F = 23.43, p < .001
2; Y = X	Constant	4.65	.49	–	9.48	.000	R ² (1, 90) = .04
	Music	.17	.09	.20	1.92	.058	F = 3.69, p < .10
3; Y = XM	Constant	3.34	.55	–	6.06	.000	R ² (2, 89) = .20
	Music	–.00	.09	–.00	–.04	.971	F = 10.91, p < .001
	Servicescape	.44	.11	.45	4.18	.000	

Notes. X = music valence, Y = purchase intention/provider, and M = servicescape.

Music valence effects

We examine the direct and provider-mediated indirect effects of servicescape attitude on purchase intention among participants in the music conditions for our test of H2; to test H3, we again perform two additional sets of analyses to test whether the effect of music valence on purchase intention is mediated, in full or part, by servicescape attitude and whether servicescape attitude plays a mediating role in accounting for the effects of music valence on provider attitude. We present the results in Table 5.

Our first set of analyses reveals that valence is a significant predictor of servicescape attitude (β = .46, p < .001) and purchase intention (β = .35, p < .001). When both servicescape and music valence serve as predictors, servicescape attitude significantly affects purchase intention (β = .54, p < .001), whereas the valence effects diminish (Sobel test: t = 3.69, p < .01) to insignificance (p > .20). In addition, we observe an increased change in the R² value when we regress two predictors on purchase intention rather than only one (R² values of .12 vs. .36; F[1, 90] = 12.36, p < .001 vs. F[2, 89] = 24.47, p < .001 for one vs. two predictors, respectively).

From our second set of analyses, we find that valence significantly influences servicescape attitude (β = .46, p < .001) and provider attitude (β = .20, p < .06). Servicescape attitude also influ-

ences provider attitude (β = .45, p < .001), and when we add it to music valence as a predictor, the valence coefficient diminishes (Sobel test: t = 3.17, p < .01) and shifts to insignificance (p > .95). In addition, we observe an increased change in the R² value when we regress two predictors on provider attitude (R² values of .12 vs. .36; F[1, 90] = 12.36, p < .001 vs. F[2, 89] = 24.47, p < .001, one vs. two predictors, respectively). Thus, in both cases, the music valence effects on provider attitude and purchase intention are fully mediated by their integration into servicescape attitude, in support of H3.

As we did in Study 1, to test the model simultaneously, we use EQS. The fit indices are satisfactory but not as good as those from Study 1 (BBNI = .92; BBNNI = .96; CFI = .97, χ² = 73.85, 49 df, p < .05; residuals distribution: average absolute SD = .07, average off-diagonal = .07, distribution slightly asymmetric, right). Again as in Study 1, our results (see Fig. 3) suggest that elicited music valence sets the stage for provider attitude and maximizes its impact on purchase intention along the following primary path: more intense music valence adds to servicescape attitude in a valence-congruent manner (standard parameter = .42, z = 3.88, p < .001), which in turn improves provider attitude (standard parameter = .42, z = 3.57, p < .01), which then has a significant influence on purchase intention (standard parameter = .33, z = 3.17, p < .01).

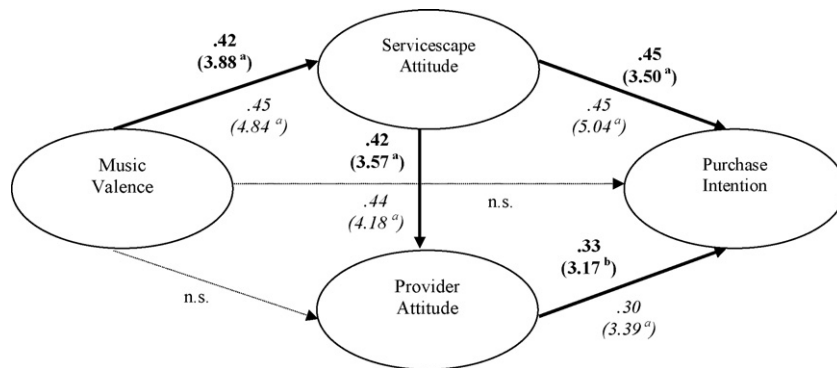


Fig. 3. Music valence effects on purchase intention—results from mediational analyses and structural modeling: Study 2. Notes. Mediational analyses are in italics and structural modeling in bold. ^ap < .001; ^bp < .01; ^cp = .10.

(standard parameter = .33, $z = 3.17$, $p < .01$). In addition, more positive servicescape attitude has a marginally significant direct effect on purchase intention (standard parameter = .45, $z = 3.50$, $p < .001$). We do not observe any direct effect of music valence on provider attitude or purchase intention.

We again examine whether the observed mediating processes are successful in influencing means. We find that in subgroups, formed a posteriori on the basis of a median music valence split (means of 4.06 and 6.32, $t[51.91] = -10.64$, $p < .001$, for moderate- and high-valence intensity subgroups, respectively), respondents who report more pleasurable, compared with less pleasurable, experiences induced by the background music also report more positive servicescape attitude (means of 5.44 and 4.73, $t[90] = -2.64$, $p < .01$), more positive provider attitude (5.87 and 5.24, $t[90] = -2.34$, $p < .05$), and stronger purchase intention (4.56 and 3.49, $t[90] = 3.38$, $p < .001$).

Discussion

The results from Study 2 generally support the dual model of environmental perception in the context of an e-service. Across all participants, the effect of the servicescape on purchase intention is partly mediated by provider attitude, and this mediating process is sensitive to the moderating effect of music. In the absence of music, servicescape effects on purchase intention are not mediated by provider attitude. When music is present, the predictive power of provider attitude for purchase intention grows stronger, and the provider-mediated effect of servicescape reaches significance. In line with Study 1, the increase in provider-mediated servicescape effects is driven primarily by the increase in the strength of provider attitude as an antecedent of service evaluation. However, while in Study 1 this effect was obtained in spite of the fact that the coloring effect of servicescape on provider attitude was diminished by the presence of music, in Study 2, the coloring effect of the servicescape on provider attitude does not vary between the music and no-music conditions. Finally, the path by which music valence influences purchase intention is similar to that observed for traditional services in Study 1; that is, the effect is fully mediated by its integration into servicescape attitude, which in turn has direct and provider-mediated effects on purchase intention.

General discussion

The results of our two studies, conducted in traditional and e-service environments, support the validity of the dual model of environmental perception as a comprehensive theoretical approach to map the psychological processes by which background music in servicescapes influences service outcomes, such as service evaluation and purchase intention. With a few exceptions that do not bear directly on our tested hypotheses, we find similar results in both studies; furthermore, at the aggregate level, when we include all participants regardless of the music background conditions, provider attitude serves as a partial mediator of servicescape effects. In both studies,

the moderating role of music presence on this relationship translates into a stronger provider–outcomes relationship and more significant provider-mediated servicescape effects when music is present. In Study 1, we observe provider-mediated servicescape effects even in the absence of music, though of weaker magnitude. In Study 2, without background music, the provider effect is not powerful enough to influence service outcomes; rather, the direct effects of the servicescape on outcomes appear to do the bulk of the work in terms of influencing service outcomes. The parameter is higher in the no-music than the music conditions in Study 2, and we observe no music presence effects at this level in Study 1. Across both studies, when music is present, the path by which valence intensity variations influence service outcomes necessarily involve a first-level integration into servicescape attitude, which then has direct and provider-mediated impacts on service outcomes. Our results therefore suggest that prior reports of direct effects of music valence on service evaluation or provider attitude (e.g., Dubé et al. 1995 for provider attitude; Caldwell and Hibbert 2002; Herrington and Capella 1996 for service evaluation) may have been confounded by their lack of consideration of the mediating role played by servicescape.

Can these results be accounted for by alternative models? We do not believe so. For example, they clearly cannot be accounted for by the traditional S-O-R models, which do not provide any rationale for why music would have affected servicescape and provider attitudes differently. According to these models, if affect transfers occur, they should occur for both the servicescape and the provider, indiscriminately. This absence of discrimination in the music effects on servicescape and provider attitudes might also have been expected from other existing models of environmental perception that posit transfers other than affect, such as inference from overall perceptions of the physical environment (Bitner 1990) or an overall image from the environment to provider attitude (Greenland and McGoldrick 1994; Sharma and Stafford 2000).

Instead, our pattern of results appears consistent with the highly differentiated psychological mechanisms that underlie the dual model of environmental perception. Across both studies, the increase in provider-mediated effects of servicescape on service outcomes in the presence of music is driven by the strengthening of the provider–outcome relationship, a hypothesis predicated on the idea that the presence of music changes the background/foreground interplay, which determines how a person perceives and responds to a service environment. These results provide novel insights into the role of music in servicescapes and support an earlier proposition by Bitner (1992), who stated that for specific environment parameters such as music to affect consumers' responses, they first must contribute to Gestalt or holistic perceptions of the physical environment. We provide a reasonable account for such mechanisms for the first time in services literature. However, additional research should examine whether the dual model of environmental perception

also accounts for the integration of other ambient cues, such as lighting or smell. The dual model posits that the presence of music operates at the perceptual level by contributing to the holistic quality of the servicescape and creating a greater contrast against which the provider stands out more powerfully; it therefore is reasonable to assume that other ambient factors might operate according to similar mechanisms. This supposition remains an empirical question for further research.

Implications for retailing practice

In retailing and other service organizations, design, engineering, and management decisions are made at the level of single environmental parameters such as music, color, lighting while the effects of these on service outcomes rely on consumers' holistic perceptions of the servicescape. The present results mapping the processes underlying how music operates contribute a much needed theoretical and empirical basis for improving such decisions. They show that decisions made at the level of specific environment parameters, such as the presence of pleasant background music, once integrated into consumer's holistic perception of the servicescape, have the potential to set the stage for creating greater customer value through improved attitude toward a given provider. That is, decisions related to the physical environment and provider performance are not independent; however, either interference or synergies is equally possible. Our research recommends more systematic and evidence-based planning of service and e-service environments, based on the effectiveness of each parameter of the physical environment to create value for consumers and contribute to operational or market outcomes. Yet, in most service firms, facilities and human resources/operations management remain separate and receive attention at different points during the firm's lifecycle. Therefore, our results also call for a dramatically different approach that balances physical and human components in both strategic planning and everyday decision making, which will translate into higher service outcomes. This shift may lead to breakthrough developments in design and management that enable firms to provide traditionally labor-intensive services in a more reliable, broader, and potentially less costly manner, which benefits both service firms and consumers.

Our results also provide insights into the design of e-environments. Prior research had shown that the atmospheric qualities of online retailing, despite possible differences in their nature and intensity, conform to well-established S-O-R models (Eroglu et al. 2001, 2003). Our results show that the more differentiated dual model of environmental perception also applies to both real and e-environments. The differentiation that occurs between the servicescape and the provider on the basis of their ground-figure qualities and ambient-focal processing at the perceptual and evaluative levels has important functional significance. As observed by Watson and colleagues (2004, p. 40), "people are using electronic networks to become and stay informed, to perform

services (banking, redeeming air miles, trading stocks), to interact with private and public institutions, to entertain themselves." Therefore, our results can help improve the design of e-environments and their market potential.

Limitations and future research

Our results must be interpreted in light of the limitations of this research. First, we acknowledge common measurement bias concerns; in both studies, we measure servicescape and provider attitudes with identical pairs of adjectives. Additional research therefore should examine different operationalizations of these constructs. However, we do not believe that this potential bias presents a significant threat to the validity of our results, because similar measurement approaches have been used extensively in advertising research on music (e.g., Gorn 1982), and the correlations between the measures in both studies are comparable to those observed in similar environmental studies (e.g., Baker et al. 2002).

Second, we undertake a double objective of considering the effects of both the presence of music and its pleasure intensity. Therefore, we suffer an unbalanced sample size to compare the baseline and music conditions, which may influence the lesser impact of provider attitude on service outcomes in the baseline conditions. Further research should replicate our results with a balanced design; however, we again believe this limitation cannot explain the theory-consistent differences observed, because not every link is less significant in the baseline compared with the music conditions.

Third, though our results across the two studies are consistent with our hypotheses derived from the dual model of environmental perception, we do not examine the proposed interplay of ambient and focal processes using formal experimental manipulations, nor do we perform precise measurements of these processes. This limitation should be the object of additional studies designed to measure more precisely or manipulate the two core concepts of ambient and focal processing, such as by using tracking devices of visual attention. Further work also should manipulate the conditions to favor one or another mode of processing and identify moderators of their respective contributions to service outcomes.

Fourth, across both studies, both the provider and the servicescape attributes were constant across music conditions and were perceived by participants as all being relatively neutral. It is not clear whether the mechanisms by which music operates would remain the same if it were integrated into more extreme instances, such as if either (or both) the provider and the servicescape were very poor or very good. This question should be examined in further research that manipulates these factors.

Fifth, we conducted our studies within a single cultural background. Some of the mechanisms we propose for the operation of music in the servicescape rely on the increased salience of the provider in the presence of music, which

increases the causal attribution of this service component and therefore its impact on service outcomes. All subjects in our studies belong to Western cultures, which tend to be biased toward focal processing, unlike the predisposition observed in Eastern cultures toward contextual information (Choi and Nisbett 1998; Chua et al. 2005a,b; Morris and Peng 1994). It would be interesting to provide a stronger test of the dual model of environmental perception by determining whether our observed effects can be replicated with participants from Asian cultures.

Despite these limitations, the insights we provide regarding how music operates in servicescapes should help designers and managers develop a more integrative approach to the decisions they make with respect to their service environment, their production, and their consumers, which should lead to superior operational, market, and financial performance.

Appendix A

A.1. Selection and validation of experimental stimuli in Study 1

We selected musical excerpts from a pool developed by Dubé et al. (1995) to vary in valence but still enable us to control for arousal and familiarity, as well as for a series of objective parameters, including tempo, rhythm, harmony, mode, pitch, and musical volume, as determined by a musical expert. The three pretested excerpts were the first movements of the following pieces: (1) Brahms, *Piano and Cello Sonata in F Major*, (2) Haydn, *String Quartets no. 3 in C Major Op. 76* (“Emperor”), and (3) Mozart, *Horn Concerto no. 3 in E Flat Major K. 447*. We hypothesized they would yield, respectively, a negative, neutral, and positive valence. Fourteen participants completed the pretest by listening to the three musical excerpts in different listening sessions in which we counterbalanced the order of the pieces. Participants rated their pleasure intensity using the Affect Grid (Russell et al. 1989), a two-dimensional grid that captures the valence and arousal elicited by different environments (Holbrook and Anand 1990). We measured familiarity using three-item, seven-point scale: not at all/very familiar, never heard/heard very often, and never listened to/listened to regularly (Cronbach’s $\alpha = .88$). Pleasure intensity differed according to our expectations; the respective means for the Brahms, Haydn, and Mozart excerpts were 3.29, 4.71, and 6.16, and they significantly differed ($t = 1.88, 45 df, p < .05$ for 1 vs. 2; $t = 1.99, 45 df, p < .05$ for 2 vs. 3). The three musical excerpts all had slow tempos (66 beats/min [BPM] or less), and their perceived level of arousal remained relatively constant (means of 2.07, 2.64, and 2.58, $p > .10$) and strongly correlated with the excerpt’s musical tempo. Overall, familiarity with each musical excerpt was weak to moderate (means of 2.54, 2.44, and 2.55, $p > .10$).

Appendix B

B.1. Selection and validation of experimental stimuli in Study 2

We selected 45 musical excerpts from three albums by Stéphane Pompougnac (*Hôtel Costes*, *Saks Fifth Avenue*, and *Hôtel Costes 5*) that possessed constant music characteristics but different levels of induced valence. His style of music can be classified as house, lounge, or downtempo music and is played in many retail outlets, especially those that offer household design objects. We conducted two pretests to, first, choose comparable musical excerpts that vary in terms of the valence induced and, second, validate the two musical CDs to be used as experimental stimuli. In the first pretest, ten participants from the same population as the main study evaluated the 45 musical excerpts, and on the basis of their subjective evaluation, we chose fifteen excerpts (seven for the moderate- and eight for the high-valence intensity music). The excerpts of both selections offered different levels of valence (means of 3.30 and 5.82 on seven-point scale for moderate and high valence intensity; $p < .05$) and were comparable in terms of familiarity and perceived stimulation. More specifically, they had an intermediate musical tempo (means of 112.78 and 119.41 BPM; $p > .10$), the participants were not familiar with the excerpts (means of 1.69 and 2.00 on seven-point scale; $p > .10$), and they induced a moderate level of stimulation (means of 4.07 and 5.23 on seven-point scale; $p > .10$).

The second pretest, involving 24 participants, validated the music valence at moderate and high intensity levels for each of the 2 CDs, to which participants were randomly assigned. Different levels of pleasure emerged (means of 4.18 and 5.39 for moderate and high valence intensity; $t = -2.47, 12.41 df, p < .05$) when we control for familiarity (2.67 and 3.25; $t = -.85, 22 df, p > .40$) and attention induced (5.33 and 4.75; $t = .63, 22.41 df, p > .60$).

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