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Dear Authors:

Thank you for the revised version of your manuscript titled "The role of background music in the visitors' experience of art exhibition: Music, Memory, and Art Appraisal". Both the paper's reviewers confirmed that you have successfully responded to their comments; one of them proposed minor revisions (see attached). Therefore, we are satisfied with the changes that you have made, and we are pleased to accept your manuscript for publication.

Your article will be published in a future issue of IJAM. However, we have a great number of articles ready for publication, and the issue in which yours will appear is yet to be determined.

We recommend that you have a native English speaker revise your manuscript to ensure that there are no writing errors. As well, please provide us with a brief (50-to-60-word) bio for each author.

Thank you for your interest in the *International Journal of Arts Management*.

André Courchesne
Editor
International Journal of Arts Management
HEC Montréal

For

Jennifer Wiggins
Associate Editor
Department of Marketing and Entrepreneurship
Kent State University

**The role of background music in the visitors' experience of art exhibition: Music,
Memory, and Art Appraisal**

Abstract

This study explores the effect of background music on the perception and memory of an art exhibition, considering art evaluation, memory and behavioural intentions in two

experiments. The first (N = 234) was a laboratory experiment conducted in a virtual art gallery. The results show that background music helps people to memorize artworks, but it negatively influences art (i.e., paintings) evaluation in terms of arousal, valence and liking. The second was a field experiment conducted in seven art galleries (N = 218). The art gallery experience is found to facilitate behavioural intentions, mediated by positive emotions and memory. Background music again acts as an ambivalent stimulus. It amplifies the link between memory and behavioural intentions while attenuating the link between pleasant arousal (i.e., emotional evaluation component) and behavioural intentions. The analysis contributes with a hitherto under-researched setting, art experience, to the literature, showing that contrary to the general conclusion in the literature, music may also cause adverse effects. We also expand the stimulus-organism-response model by introducing memory to atmospheric research on music. Art gallery managers can benefit from music due to favourable memory effects. However, the background music needs to match the artwork style (without the stimulus of music overlapping that of the paintings).

Keywords: background music, art gallery, experience, positive emotions, memory, behavioural intentions

Introduction

The influence of music in retailing is widely discussed in the existing literature (e.g., Eroglu, Machleit, and Chebat, 2005; Mattila and Wirtz, 2001; Morin, Dubé, and Chebat, 2007; Oakes and North, 2008). Music is a powerful stimulus and its presence can positively influence consumers' affective, cognitive and behavioural responses (Jain and Bagdare, 2011; Roschk, Loureiro, and Breitsohl, 2017). Two boundary conditions for this effect are documented. Ambient music needs to be congruent with the specific product category, brand, or the overall experience (Kellaris, Cox, and Cox, 1993; MacInnis and Park, 1991; Chebat, Chebat, and Vaillant, 2001; Mattila and Wirtz, 2001; Jain and Bagdare, 2011; Spangenberg, Grohmann and Sprott 2005). Furthermore, music is better able to increase cognitions when other cognitive cues are either absent or significantly reduced (e.g., Chebat, Chebat, and Vaillant, 2001).

The consumer experience in the arts industry has unique characteristics (Joy and Sherry, 2003; Uusitalo, Simola, and Kuisma, 2012). In art exhibitions, the consumer experience is strongly marked by the aesthetic perception of one stimulus, the artwork, which goes beyond a merely rational evaluation (Bourgeon-Renault, 2000; Cirrincione, Estes, and Carù, 2014). Aesthetic experience in general and the contemplation of art in particular is a special, psychological process involving attention focused on the object (i.e., the artwork) and the suppression of everyday concerns (Cupchik et al., 2009). Therefore, the place of the exhibition is usually marked by a purposeful elimination or reduction of other visual stimuli in order not to distract the visitor from the object (artwork). Past research even shows that when visitors to museums or art galleries contemplate the aesthetic properties of paintings, a different set of neural processes is activated compared to when they merely view the same visual images as it would be the case in a retail establishment (Höfel and Jacobsen, 2007).

However, the way the presence or absence of music influences art evaluation, memory, and behavioural intentions in aesthetic environments such as art galleries has not yet been studied. To fill this gap in literature, we conducted two studies. The first study is a laboratory experiment in a virtual art gallery. It explores the effect of background music on the perception and the memory of an art exhibition. Hereby, the perception of an art exhibition is captured by perceived valence, arousal, and liking; and the memory of an art exhibition by the recall of artworks. The second study investigates the effects of background music in a field experiment in real art galleries. It extends the stimulus-organism-response (S-O-R) model (Mehrabian and Russell, 1974; Donovan and Rossiter, 1982) by incorporating the concepts of experience and memory.

The current study makes two main contributions: First, we assess the effect of background music in the special case of art experience. While the general tenet renders music as favourable stimulus (Roschk, Loureiro, and Breitsohl, 2017), we show that music—by decreasing art evaluations (Study 1) and interfering with the emotional appraisal of the art gallery experience (Study 2)—may also cause adverse effects. Second, we introduce memory to the study of background music, which reveals that music has also desirable effects: The presence of music facilitates the recall of the presented paintings (Study 1) and it amplifies the link between memory and behavioural intentions (Study 2).

In the remainder of the article we review literature conceptualizing the role of art galleries and the value lying in the artwork experience. This is followed by a review of how background music influences art appraisal, consumer behaviour, and art memory. Next, we present two experiments, which first introduce two sets of consecutive hypotheses and then test them in a laboratory setting (virtual art gallery; Study 1) and a

real field setting (seven art galleries; Study 2). The article concludes with a discussion of the results, limitations, and avenues for further research.

Theoretical Background

Art galleries and their role within the art world

The arts world has been illustratively labelled as a “complex beast that is mutating all the time” (Thornton 2009, p. 256). Analysing its underlying mechanisms, Rodner and Thomson (2013) identify a structured network of agents that work in an interdependent manner. In this network, art galleries represent one agent that links the artist from the art school to the wider audience of art collectors (Rodner and Thomson, 2013). By making the artist familiar to the wider audience, art galleries serve two functions that add primarily financial but also symbolic value to the artist’s work.

First, art galleries serve as marketing and selling platforms. Botti (2000) defines the marketing function in the arts domain as the appropriate management and transfer of the artistic potential of the product (i.e., the artwork) to different publics. Accordingly, art galleries are responsible to exhibit, promote, and sell on behalf of the artist (Rodner and Thomson, 2013). In return, art galleries charge a commission fee or a percentage of the sales price (Preece and Kerrigan, 2015). While the price of an artwork may be no more than a wild guess, the commission fees may amount up to 50% of the sales price (Preece and Kerrigan, 2015; Velthuis, 2007).

In their second function, art galleries act as tastemakers or, to put it in different terms, as cultural gatekeepers (Becker, 1982; Chong, 2010). The gallery owners take on the responsibility of interpreting the work and they exhibit sufficient authority to legitimise the artist’s work as art simply by treating it as such (Moody, 2005). Thus, galleries provide reassurance for the art collector’s financial investment as well as value to the

artist's name (Hernando and Campo 2017b; Preece and Kerrigan, 2015; Rodner and Thomson, 2013). If the artist's name grows as a brand it may also lead to a heightened reputation of the gallery, rendering both agents as mutually dependent (Hernando and Campo 2017a; Rodner and Thomson, 2013). Summarizing, by integrating the artist into the society's economy, the art galleries transform the aesthetic value of the artwork into commercial value (Becker, 1982; Botti, 2000).

Conceptualizing the value that lies in the artwork experience

With talent and raw materials like canvas, paint, and brushes the artist may create a masterpiece that is worth millions (Rodner and Thomson, 2013). To understand and to conceptualize the value that lies in the experience of artworks different approaches have been utilized. Specifically, we will draw on the concepts of experiential consumption, artistic value, aesthetics as consumer value, and the concept of flow.

The concept of *experiential consumption* has been introduced by Holbrook and Hirschman (1982). They extend the traditional information processing model of consumer behaviour to incorporate experiential (or hedonic) aspects of consumption. Experiential consumption is defined as “those facets of consumer behaviour that relate to the multisensory, fantasy and emotive aspects,” which result from the consumer's interaction with the product or service consumed (Hirschman and Holbrook 1982, p. 92). Artwork, films, music, or fine arts are regarded as aesthetic experiences (Holbrook and Hirschman, 1982; Carù and Cova, 2005; Bourgeon-Renault et al., 2006). Aesthetic experiences go beyond merely hedonic experience. They aim to understand, appreciate and absorb the object's aesthetic properties and “should be grounded in an acceptable interpretation of its object, and an acceptable interpretation is one that maximizes the

value of the experience while being constrained by the objective or base properties of the object” (Goldman, 2006, p. 339–341).

Experiential consumption follows the same pattern as traditional consumption. Environmental and consumer inputs are processed in terms of cognition, affect, and behaviour (Holbrook and Hirschman, 1982). The experiential view, however, stresses aspects that are not covered by the traditional approach. Specifically, the experiential view focuses on aspects such as pictorial imagery or fantasies that lie just below the threshold of consciousness (cognitions), emotions and feelings developed due to the experience (affect), and on the consumption of a product or service (and not the mere contemplation of the purchase) such as the allocation of time in case of entertainment offerings (behaviour) (Holbrook and Hirschmann, 1982). Transferred to the experience of artworks, artists want viewers to engage in their artwork and attempt to evoke emotions, senses and (intellectual) reactions, but not necessarily engage in physical actions and behaviours, that is, individuals can see the objects without touching them.

Botti (2000) introduces the concept of *artistic value* and describes it as the potential of emotional flow that is experienced by observers from the artwork. This approach understands the value of artworks as the uniqueness of the emotional interaction that the art produces with the observer (Botti, 2000). In a similar vein of movies, Aurier and Guintcheva (2015) report that the felt emotions during a movie represent a key component for the final evaluation of the theatre experience. Thus, the concept of artistic value takes the experiential view one step further and considers the affective component as the defining element for the value of the artistic experience. Since the evoked emotions by the artwork varies from person to person and may even vary for the same person at different occasions (Evrard, 1997), the artistic value entailed in an artwork is highly subjective and dependent upon the situation.

Considering *aesthetics as a consumer value* is an idea advocated by Holbrook (1999). In its purest form the value of aesthetics is suggested to occur in fine arts (i.e., music, dance, painting, sculpture, and poetry) through the experience of beauty (Wagner, 1999). Although, values other than aesthetics also represent a source of deriving pleasure, the pleasure derived from beauty has unique characteristics: First, it is immediate as it takes the consumer by surprise; second, it is intense due to the involved emotions that act as facilitators of experienced joy or delight; third it may also involve an involuntary psychological response like a tightening of the stomach or the onset of tears (Eibl-Eibesfeldt, 1988; Wagner, 1999). Thus, an artist's work is becoming amenable to consumers by way of its aesthetic value, especially, by its experienced beauty.

Finally, the *concept of flow* provides another perspective that is helpful in understanding the value of the artwork experience. Viewing art is a psychological process involving attention focused on the object and the suppression of everyday concerns (Cupchik and Winston, 1996). Being focused and being outside of everyday reality are feelings that are associated with the state of flow, which has been used in prior studies of aesthetic experience (Csikszentmihalyi 1992, 1997; Csikszentmihalyi and Robinson, 1990). Flow describes a mental state in which perceived challenges stretch—that is they neither overmatch nor underutilize—existing skills (Nakamura and Csikszentmihalyi 2001). In case of viewing art this stretch is reflected in the individual's ability to come to an acceptable interpretation of the object in light of the object's difficulty. When being in a state of flow a person experiences viewing art as something intrinsically rewarding (Nakamura and Csikszentmihalyi, 2001). As such, flow may be seen as an explanation for why enjoyment and pleasure are generated by engaged contemplation of artworks (Cupchick et al., 2009).

In sum, these four concepts share overlapping themes as well as provide idiosyncratic perspectives to describe the value that is derived from the experience of artworks. Cognitively, artworks allow the observer to engage in fantasies, challenging their skills, and to get immersed in a different world. Affectively, strong emphasis is put on the emotions evoked by the artworks that are paralleled by the derived pleasure and beauty being found in the work. Behaviourally, intellectual reactions, spending time or involuntary physiological reactions may be triggered by artworks. Having described the value that consumers find in artworks, the next sections describe how background music affects consumers' artwork appraisal, behaviour, and memory.

Background music and artwork appraisal

Emotions are embedded within the process of contemplation of the art experience (Joy and Sherry, 2003; Silvia, 2005). They are understood as a result of the interaction between cognitive appraisal and the senses and feelings of the body (Cirrincione, Estes, and Carù, 2014).

Appraisal theory (Lazarus, 1991; Roseman and Evdokas, 2004) regards emotions as the result of a cognitive process of appraisal. In other words, emotions are elicited by evaluations (appraisals) of events, situations, or objects (Roseman and Smith, 2001). Transferred to the contemplation of an art experience, the appraisal can relate to a specific painting as well as to the entire event, which besides a specific artwork also comprises other works as well as environmental aspects such as background music. Appraisal theory furthermore suggests that art events do not cause emotions, but that emotions emerge from the subjective appraisal of the art event.

Another perspective comes from environmental psychology (Mehrabian and Russell, 1974) and is introduced to retail settings by Donovan and Rossiter (1982). The S-O-R

framework, is transferred as atmosphere, emotions and approach/avoidance. Atmospheric cues comprise social (people in the store), design (visual cues of layout, clutter, cleanliness and colour) and importantly ambient factors (non-visual cues including in particular background music) (Eroglu, Machleit, and Davis, 2001, 2003), which act as stimuli influencing people's emotional states (e.g., pleasure or arousal). Subsequently occurring emotions result in approach or avoidance behaviours that comprise psychological reactions such as attitudes and/or behavioural reactions such as duration of visit, the number of products purchased, or the amount of money spent (Morrison et al. 2011; Sherman, Mathur, and Smith, 1997).

As proposed by appraisal theory, in the S-O-R framework emotions may result from a cognitive appraisal process of the artworks and the surrounding atmosphere including background music. Thus, the S-O-R framework is aligned with appraisal theory, but besides emotions, it also considers approach or avoidance behaviours.

Background music and consumer behaviour

Music has been considered a key element in store atmosphere (Roschk, Loureiro, and Breitsohl, 2017; Turley and Milliman, 2000). Enjoyable music evokes pleasure in consumers' minds and leads to more favourable consumer reactions from the firm's perspective (Eroglu, Machleit, and Chebat, 2005; Morin, Dubé, and Chebat, 2007; Hul, Dubé, and Chebat, 1997). Prior studies highlight that appropriate music can increase the time spent and consequently sales (Mattila and Wirtz, 2001; Milliman, 1982); foster purchase intentions (Baker et al., 2002); decrease the perception of waiting time (Hul, Dubé, and Chebat, 1997; Chebat Chebat, and Vaillant, 2001); or facilitate consumer interaction (Dubé, Chebat, and Morin, 1995). In a recent meta-analysis, the synthesized findings of experimental music studies in retail settings show reliable patterns of the

presence (vs. absence) of music fostering consumers' felt pleasure, satisfaction evaluations, and behavioural (i.e., purchase) intentions (Roschk, Loureiro, and Breitsohl, 2017).

Complementing these findings, another meta-analysis by Garlin and Owen (2006) indicates that certain music properties such as tempo affects in-store behaviour. From a psychological perspective, it is suggested that fast tempo music evokes emotions with high energy levels as compared to slow tempo music that evokes emotions with low energy levels (Thompson and Quinto, 2011). Thus, such emotional contagion may be seen as an explanation for why faster music results in subjects staying marginally less time and increases their arousal (Garlin and Owen, 2006).

Background music and memory

While memory effects have not yet been documented in atmospheric retail research, scholars have analysed the influence of music on advertising's effectiveness in terms of recall and recognition (Kellaris, Cox, and Cox, 1993; Zhu and Meyers-Levy, 2005; Meyers-Levy and Zhu, 2010). Results from this research show that music can actually stimulate cognitive processes through familiarity and meaning (Kellaris, Cox, and Cox, 1993; MacInnis and Park, 1991). Consumers can construct two types of meanings from music, influencing the cognitive load with which music is processed (Zhu and Meyers-Levy, 2005; Meyers-Levy and Zhu, 2010): Embodied meaning refers to the hedonic value or favourableness and is supposed to require relatively few cognitive resources in evaluating whether the music is pleasant or not. Referential meaning refers to associations between the music and the extra-musical environment and as such should require more cognitive resources.

Results from this research further indicate boundary conditions for the effect of music on memory. First and in line with findings from atmospheric retail research (e.g., Spangenberg, Grohmann, and Sprott, 2005), the evidence indicates that music needs to be congruent to the ad message. Specifically, music that is congruent to the ad message improves brand recall and recognition while music that is incongruent obstructs brand recall and recognition (Kellaris, Cox, and Cox, 1993). Second, stimuli in multiple modalities (e.g., visual, olfactory, auditory) may interrupt attentional processes (Cauberghe and De Pelsmacker, 2010; Ryu et al., 2007). According to Choi, Lee, and Li (2013), music distracts from an advertising message (in a video game context) because sound intrudes on perceptions and subsequently causes greater attentional selectivity.

Overview of current studies

We study in two experiments how consumers' perception processes within art galleries are influenced by the absence versus the presence of background music. For this purpose, Study 1 tests if artworks are evaluated and memorized differently across music conditions. We employed a laboratory setting in order to favour internal validity. Study 2 takes a more general approach and tests how the perception of the art gallery experience as a whole is influenced by absence versus presence of music. In line with the more general approach, we used a field setting in order to favour external validity.

Study 1: background music or just noise at a virtual art gallery

Hypotheses

Study 1 is an experiment designed to test two hypotheses. As discussed above, the presence of two or more stimuli may cause distraction (Cauberghe and De Pelsmacker, 2010; Ryu et al., 2007). According to these findings and based on Eskine, Kacinik, and

Prinz' (2012) and Silvia's (2005) experiments, we expect that auditory (background music) and visual stimuli (paintings) compete in consumers' minds during art appraisal and induce an unfavourable artwork (paintings) evaluation. Therefore, we hypothesize:

H1: Artworks will be evaluated more negatively when viewed with background music than without background music.

Since background music has been meta-analytically found to foster satisfaction and behavioural intentions (Roschk, Loureiro, and Breitsohl, 2017), we consider the presence of music within an art exhibition as a desirable condition with regard to memory. Visitors may turn their attention to the embodied and referential meaning of music, which helps them to form memory associations. Therefore and in combination with findings that music can favour brand recall and recognition in an advertising context (Kellaris, Cox, and Cox, 1993; MacInnis and Park, 1991), we propose:

H2: Artworks will be remembered better after having been viewed with music than without music.

Selection of artists

Two artists well known in Portugal and abroad were selected. The two artists, Vieira da Silva (VS) and Paula Rego (PR) (see Figure 1) have very different styles. Vieira da Silva (1908-1992) born in Lisbon and died in Paris. She lived in Portugal, Brazil and France but most of the time in France. Her paintings represent an Abstract art movement that emerged in the 20th century. This movement, where human or animal figures, landscape or other elements from the concrete world are not clearly visible or represented, melds Cubism, Futurism, and Constructivism with jagged shapes fracturing the picture plane.

Cubism is a style embedded in the whole concept of Abstract art, which was created in Paris (1907 to 1914) by Pablo Picasso and Georges Braque. The Cubist style emphasized the flat, two-dimensional surface of the picture plane, rejecting the traditional techniques of perspective, foreshortening, modelling, and chiaroscuro, thus refuting theory that art should imitate nature. Cubist artists are not bound to copying form, texture, colour, and space. Instead, they want to present a new reality in paintings that depicts radically fragmented objects. Futurism is the Italian avant-garde art movement of the 20th century which celebrates advanced technology and urban modernity. This art intends to destroy older forms of culture and to demonstrate the beauty of modern life—the beauty of the machine, speed, violence and change. Constructivism is an art movement that flourished in Russia in the 20th century as it is trying to make the transition from the artist's studio to the factory, that is, the mass production. Constructivism intends to demonstrate how materials behave and carry out a fundamental analysis of the materials and forms leading to the design of functional objects and painters' desire to express the experience of modern life with its dynamism and its new and disorientating qualities of space and time.

Paula Rego was born in Lisbon in 1935 and currently lives in the United Kingdom (London). Her paintings combine seemingly disparate themes and traditions bringing together the comic and the grotesque to figurative paintings. Pure Figurative art is derived from real objects, retaining strong references to the real world and particularly to the human figure.

PLACE FIGURE 1 ABOUT HERE

Pre-test: congruence between musical pieces and painting style

Based on previous research relating to the appropriateness of music to the specific environment (Areni and Kim, 1993), instrumental music was chosen as appropriate for this study because individuals' responses to music are likely to be affected by the choice of words in the lyrics or the associations made with it (Oakes, 2000). The procedure adopted was a sequence of six composition excerpts (about one minute each), chosen especially for possible adaptation to the art of Paula Rego and Vieira da Silva. The six excerpts were selected from an initial list of 12 pieces based on the opinions of six experts (owners of art galleries in Lisbon and Cascais), who considered those musical excerpts suitable for use in an art exhibition environment. The musical excerpts were played through the laboratory audio system, allowing the music to be evenly listened to throughout the room. The participants were a group of 70 individuals drawn from the same population as the experiment (60% female and 40% male).

After listening to each composition, participants associated each composition excerpt with qualitative attributes that best translate their perceptions about music (North and Hargreaves, 1998), from the following: slow, calm, relaxing, peaceful, sad, joyful, stirring, strong, exciting, lively and neutral. Finally, participants were asked to observe two series of images (paintings by the two artists used in the subsequent experiment) and to evaluate the congruency of each piece of music with the artistic style.

From the six music excerpts we selected Sunny (artist Jazeboo) and Starlight Memories (artist Dennis Kuo). Given both artist's different styles, each composition fitted one artist: Sunny was rated congruent with the works of VS ($M = 3.8$ on a 5-point scale) and Starlight Memories with the works of PR ($M = 4.2$ on a 5-point scale). Further, Sunny was described by most participants as "stirring" or more arousing while Starlight

Memories was described as "calm" or less arousing. Accordingly, Sunny represented the high arousal condition and Starlight Memories the less arousing condition.

Participants, procedure, and variables

Two hundred and thirty-four individuals, 18 to 85 years old with a mean age of 47 years (65% female), were recruited from undergraduate and graduate programs (master) at two public universities and two senior universities in Lisbon. Most participants (52%) visit museums and galleries on average six times a year or once a month. Respondents participated voluntarily and did not receive any compensation. Young participants came from two major public universities in Lisbon and were mostly full-time students with some master students already being employed. Senior participants came from two senior universities in Lisbon. These institutions do not award a diploma or academic degree. Rather, they are places where retired people meet to learn more about a large range of subjects such as history, language, music, and geography. They have had a variety of jobs, such as teachers, bank clerks, and civil servants.

Participants were invited to a virtual art gallery. In the laboratory, the paintings by both artists were shown via a projector. The room was equipped with an audio system. Participants were randomly assigned to one of three groups: without background music (N = 66, 30 young and 33 senior), with Sunny music (stirring or more arousing music; N = 85, 36 young and 49 senior), and with Starlight Memories music (calm or less arousing; N = 83, 39 young and 44 senior). *Sunny* measures 120 BPM (beats per minute) and *Starlight Memories* 88 BPM. According to Milliman (1982, 1986), *Sunny* is a fast-tempo (above 94 BPM) and *Starlight Memories* is a slow-tempo composition. The two pieces of music fall within the range of 67-178 BPM, which is identified as the tempo range that consumers prefer most (Kellaris and Kent, 1991).

Participants viewed and evaluated 16 paintings (eight VS paintings randomly intermixed with eight PR paintings). They were instructed as follows: “Imagine that you are in an art gallery. Think of the environment around you and how you might feel if you saw these paintings in an art gallery.” For each painting (time for visualization 60 seconds) participants rated arousal (from “calming” to “exciting”) and valence (from “negative” to “positive”) from the painting, and their liking of the painting (from “not at all” to “very much”) using 5-point scales. After each painting, they advanced to the next.

The procedure in the memory phase is based on the approach by Taylor, Buratto and Henson (2013). Participants viewed and evaluated 16 paintings (8 previously seen and 8 new by the same artists) in a random, intermixed order with each painting being seen for 60 seconds. Participants were instructed as follows: “We will now assess your ability to remember the paintings you just saw. We will show you a series of 16 paintings, one at a time. Some will be paintings that you saw in the first part of the study, but others will be completely new. Your task is to identify which ones you saw in the first part of the study and which ones you did not see. You will have two options: “remember” (if you remember the appearance of the painting in the first part of the study) and “new” (if you did not see the painting in the first part of the study).”

After the evaluation and recall of the paintings, participants were asked to rate on a 6-point scale the overall impression about the experience (from “very negative” to “very positive”), which allows the cognitive response to be measured. Participants were also invited to identify the artists, if they recognized them, and describe their styles (“completely opposite”, “with traits in common” and “very similar”). In the two conditions where music was included, they were asked whether or not they had realized the presence of background music (based on response options “not realized”, “I realized, but I felt uncomfortable,” and “I realized and thought nice”). They also gave their opinion

on a 6-point scale (from “I did not like” to “I liked a lot”), about the music. Noise sensitivity was measured using the short form (5 items, Cronbach $\alpha = 0.66$) of the Individual Noise Sensitivity scale (NSS-SF; Benfield et al., 2014). For each item, participants indicated their level of agreement, using a 6-point scale (higher scores indicate greater noise sensitivity; Weinstein, 1978).

The questionnaire used was prepared in two languages, Portuguese and English. Back translation was used to ensure both questionnaires communicated the same information (Sekaran, 1983). A pilot sample with ten individuals from the same population as the experiment was used to ensure that the wording of the questionnaire was clear and only a few adjustments were made.

Results

Considering the control factors of the experiment, the three groups did not differ in noise sensitivity, knowledge of the two artists, perceptions of artists’ styles and perception of background music (see Table 1, panel control factors).

PLACE TABLE 1 ABOUT HERE

Hypothesis 1. The proposed effect of background music on artwork evaluation and its robustness across the two artists, was analysed using 3 (with and without background music, between-participants) x 2 (artists, within-participants) repeated ANOVAs on arousal, valence, liking and overall experience ratings (see Table 1, panel art evaluation). Additionally, we used t-tests to compare both artists. First, there are differences between the artists as indicated by significant main effects. Compared to Paula Rego, Vieira da Silva paintings are rated significantly more arousing ($t[233] = -5.01, p < 0.001$), positive (i.e., valence; $t[233] = -7.48, p < 0.001$) and likeable $t[233] = -9.24, p < 0.001$). Second, we find significant differences between the three music conditions in arousal

($F[2,231] = 3.24, p < 0.05$), valence ($F[2,231] = 3.86, p < 0.05$), and liking ($F[2,231] = 4.71, p < 0.05$), but not in overall experience ($F[2, 227] = 1.32, p = 0.27$).

The means indicate that the groups with music have lower art evaluation ratings than the group without background music. When comparing the group of respondents who see the paintings with music with those who see the same paintings without music (see Table 2), the art evaluation in terms of arousal, valence and liking is significantly lower in the condition with music than in the condition without music. Therefore, H1 is supported.

PLACE TABLE 2 ABOUT HERE

We also refined the analysis by exploring art evaluation (arousal, valence and liking) between age groups and gender (Golnaz et al. 2015), and took other variables such as the frequency of visits to art exhibitions and familiarity with artists' work into consideration. In this vein, when comparing between age groups (below 30 years old and above 50 years old), participants above 50 years old tend to rate paintings significantly more positively (valence) than participants below 30 years old ($t[227] = -2.13, p < 0.05$), but there are no significant differences for arousal ($t[227] = -0.77, p = 0.45$) and liking ($t[227] = -0.72, p = 0.47$). Comparing females and males, we do not find significant differences in art evaluation for arousal ($t[227] = 0.44, p = 0.66$), valence ($t[227] = 0.04, p = 0.97$) and liking ($t[227] = 0.21, p = 0.84$). Considering groups of participants according to the frequency of visits to art exhibitions and how they evaluate both artists' paintings, there are significant differences for arousal ($\chi^2[3] = 13.58, p < 0.01$), valence ($\chi^2[3] = 16.94, p < 0.01$), and liking ($\chi^2[3] = 12.81, p < 0.01$). The degree of familiarity with the artists is also examined. We find significant differences in art evaluation among participants who are familiar with the work of one artist, participants familiar with both artists, and participants not familiar with either artist. Thus, participants familiar with one or both artists tend to show higher arousal ($\chi^2[3] = 17.12, p < 0.01$), more positive valence

($\chi^2[3] = 18.47, p < 0.001$), and higher liking ($\chi^2[3] = 19.45, p < 0.001$) ratings than participants unfamiliar with the artists.

Hypothesis 2. Following the procedures by Taylor, Buratto, and Henson (2013), memory scores were calculated by subtracting the incorrect “recall” responses to the non-presented lure items from the correct “recall” responses to the presented items. This calculation corrects for participants’ tendency to “guess recall” items that are in fact new. The results are presented in Tables 1 and 2, panel art memory. The total scores indicate that the paintings are significantly more likely to be remembered when viewed with background music than without background music ($\chi^2[2] = 6.74, p < 0.05$). Thus, H2 is supported. In addition, the results show a non-significant ($p > .10$) tendency that the memory scores for the less arousing music condition are larger than for the more arousing condition (see Table 1, panel art memory).

Discussion of Study 1

Prior research has highlighted the importance of pleasant music in store environments in order to foster behavioural intentions or store image (Eroglu, Machleit and Chebat, 2005; Morin, Dubé, and Chebat 2007; Hul, Dubé, and Chebat, 1997). Yet in the case of aesthetic experiences, particularly art exhibitions, the presence of environmental stimuli may interfere and affect art evaluation unfavourably. Specifically, in Study 1 three groups of participants were exposed to different background music conditions and evaluated a series of paintings by Paula Rego and Vieira da Silva. The results show that participants rate the paintings in terms of arousal, valence, and liking more negatively with music than without background music. As such, ambient stimuli (like background music) may act as a distraction from the most important element: art. These findings mirror the results of Eskine, Kacinik, and Prinz, (2012), who found the inverse pattern, namely that after

receiving a negative stimulus (like a bad smell, irritating music) people tend to judge the second stimulus (e.g., a painting) more positively. Our findings also relate to Cirrincione, Estes, and Carù (2014), who reveal that individuals tend to evaluate artwork more negatively when viewed with a pleasant ambient scent than with a neutral scent. Similarly, in our study participants gave lower evaluations in the condition with background music than in the neutral condition without background music.

Despite the unfavourable effect of music on art evaluation, the results also show that participants tend to remember the paintings better if they have seen them with background music. Hence, music seems to play an important role, helping the memorization process. This aspect could be particularly interesting to managers and owners of art galleries when promoting new or not well-known artists.

Although our study was conducted carefully and invited participants to experience a virtual aesthetic experience, it would be interesting to further understanding of the role of background music in real art galleries and how consumers' perception processes are influenced by the absence versus presence of background music. Thus, Study 2 uses a field experiment to investigate real settings. The objectives are to embed memory in a nomological framework comprising art gallery experience, emotions and behavioural intentions, and to find further support for the unfavourable evaluation and beneficial memory effects of music.

Study 2: background music and behavioural intentions in real art galleries

Hypotheses

Study 2 tests, subject to the presence vs. absence of background music, if the aesthetic experience at an art gallery positively influences behavioural intentions directly or indirectly through positive emotions and memory (see Figure 1). The focus is the art

gallery as a whole. In this real setting it is possible to have an aesthetic experience when viewing artworks of different styles (i.e., no particular style of painting was selected).

Experiences are connected to emotions, which have been conceptualized as the result of a cognitive process of appraisal that can come from the paintings and their surroundings (i.e., the stimuli) in an art gallery (Hirschman and Holbrook, 1982; Joy and Sherry, 2003; Silvia, 2005; Bourgeon-Renault et al., 2006; Lazarus, 1991; Roseman and Evdokas, 2004). Further, experiences are connected to cognitive stimulation in order to encode memories and to foster behavioural intentions (Oh, Fiore, and Jeoung, 2007). As such, it has been shown that a pleasant ambience enhances memory of products, since they receive greater attention (Dolcos and Cabeza, 2002; Morrin and Ratneshwar, 2003), and increases the likelihood to revisit and recommend the store or place (Baker et al., 2002; Otto and Ritchie, 1996). Thus, when engaging in a pleasant art exhibition experience visitors may focus their attention on the paintings and enhance their memory formation about the paintings. The stimuli from an art exhibition will generate in the visitor's mind the intention to revisit and recommend to others. Therefore:

H3: The art gallery experience positively influences visitors' pleasant arousal.

H4: The art gallery experience positively influences visitors' behavioural intention.

H5: The art gallery experience positively influences visitors' positive memories.

H6: Visitors' pleasant arousal positively influences their positive memories.

Based on the S-O-R framework, emotions should act as a mediator between stimuli and outcomes and so behavioural intentions can be enhanced by emotions (Baker et al., 2002). A positive memory also increases the likelihood of repeat visits and positive word-of-mouth communication (e.g., Dolcos and Cabeza, 2002; Martin, 2010). Therefore, visitors to an art gallery, who have a favourable experience, will be more likely to recommend the gallery to others and such behaviour will be fostered by pleasurable

emotions and positive memories. This leads us to propose the following hypotheses (see Figure 2):

H7: Pleasant arousal positively influences visitors' behavioural intention.

H8: Memory positively influences visitors' behavioural intention.

Several studies on background music point out that background music and visual stimuli can compete in the consumers' mind and induce unfavourable artwork (paintings) evaluation (e.g., Cauberghe and De Pelsmacker, 2010; Eskine, Kacinik, and Prinz, 2012; Choi, Lee, and Li, 2013). However, other studies also claim that music can help cognitively to encode information about a brand or product in the consumer's mind (Banbury et al., 2001; Choi, Lee, and Li, 2013). Study 1 also allows the understanding that, in a virtual artwork exhibition context, art will be evaluated more negatively when viewed with background music than without background music, but music may help the cognitive process of memorizing artwork. In this vein, music is expected to play the following role in the cognitive process of art appraisal and in the behavioural intention to revisit the gallery and recommend it to others:

H9a: The presence (vs. absence) of music in art galleries attenuates the positive relationship between pleasant arousal and behavioural intentions.

H9b: The presence (vs. absence) of music in art galleries amplifies the positive relationship between memory and behavioural intentions.

PLACE FIGURE 2 ABOUT HERE

Procedure and participants

Seven well-known art galleries in Lisbon agreed to collaborate in the study. All of them have the same colour on the walls: white. Four were assigned to the condition without background music. The other three were assigned to the condition with

background music. The art gallery owners used their own style of music in order to keep the field experiment exactly as they would use it. Further, the music was employed only as an ambience factor (i.e., no aurally based pieces were exhibited nor was it supposed to purposefully disturb emotions as part of the art experience). We did not change any other elements in the galleries. The galleries showed artists with different styles of work.

Data collection took place over five months. We did not invite potential participants to visit the galleries. Instead, we defined a schedule to visit the galleries at different times of the week to check the conditions established and collect the questionnaires. During the period of the study the gallery owners kept the same exhibition (even paintings sold were not removed) and the same background music in order to ensure constant field conditions.

The questionnaire was first prepared in English and translated to Portuguese, with the help of language teachers. Then back translation was used to ensure that both questionnaires communicated the same information (Sekaran, 1983). A pilot sample with ten visitors and owners of the art galleries was used to ensure that the wording of the questionnaire was clear and only a few adjustments were made. The last part of the questionnaire concerned socio-demographic data about gender and age.

A total of two hundred and eighteen questionnaires were collected, 114 from galleries without background music and 104 from galleries with background music. Of the participants, 62% are female and 45% are between 26 and 50 years old with a mean age of 35 years. The majority of participants were residents of Portugal (79%) and came from various cities (other than Lisbon) and islands. Participants who were not from Portugal were tourists coming from abroad, especially the UK, Spain and Italy.

Variables

Art gallery experience was measured using 9 items adapted from Brakus, Schmitt, and Zarantonello (2009). Those items measure the sensory, affective and intellectual components of artwork experience. The behavioural component was not considered since contemplating physical actions and bodily experiences are connected to a brand or product. Viewing art at galleries does not include such components. In addition, the affective component was not considered since the emotional aspect of the experience was measured through pleasant arousal. Pleasant arousal was assessed using four items based on Oh, Fiore, and Jeoung (2007) and Finn (2005). Memory was measured using three items based on Pine and Gilmore (1999) and Oh, Fiore, and Jeoung (2007). Finally, behavioural intentions were captured with four items from Zeithaml, Berry, and Parasuraman (1996) and Loureiro and González (2008). All items were rated using 5-point Likert type scales (1 = “strongly disagree” to 5 = “strongly agree”).

Results

The Partial Least Squares approach (PLS) was employed to estimate the measurement and structural parameters of the structural equation model. PLS enables researchers to avoid biased and inconsistent parameter estimates, and it is an effective analytical tool that allows modelling formative constructs. The proposed model of this study has a second order formative construct (i.e., artwork experience) and PLS path modelling allows the conceptualization of higher-order factors through its repeated use of manifest variables (Chin, Marcolin, and Newsted, 2003; Hair et al., 2012).

Measurement results. The adequacy of measurement was assessed by evaluating the item and composite reliabilities as well as discriminant validity. Item reliability for the reflective measures was assessed by examining the loadings of the measures on their

corresponding construct. Items with loadings of 0.707 or higher should be accepted, indicating that over 50% of the variance in the observed variable is explained by the construct (Wetzels, Odekerken-Schröder, and van Oppen, 2009). In addition, composite reliability values should exceed the 0.8 threshold. Table 3 shows that all items have an item loading higher or equal to 0.707. Table 3 further indicates that composite reliabilities exceed the normative value. There is only one exception: When music was not playing, behavioural intentions show a composite reliability value of 0.794, which is, nevertheless, close to the 0.8 threshold.

Item reliability for the second-order formative construct was assessed via the parameter estimates of indicator weights, the significance of weights (t-value), and the multicollinearity of the indicators. The weight estimates measure the contribution of each formative indicator to the variance of the latent variable (Robert and Thatcher, 2009). The recommended indicator weight is >0.2 (Chin, 1998). Table 3 shows that the two indicators (sensory and intellectual) have a positive beta weight above 0.2, which are also significant at $p < .001$. The degree of multicollinearity among the formative indicators should be assessed by the variance inflation factor (VIF; Fornell and Bookstein, 1982). The VIF indicates how much an indicator's variance is explained by the other indicators of the same construct. The common acceptable threshold for VIF is below 3.33 (Diamantopoulos and Siguaw, 2006), which is met by our data (see Table 3). In sum, the reflective and formative constructs can be considered reliable (Hair et al., 2012; Wetzels, Odekerken-Schröder, and van Oppen, 2009).

PLACE TABLE 3 ABOUT HERE

Discriminant validity was assessed according to the Fornell and Larcker (1981) criterion: the average variance extracted (AVE) should be greater than the variance shared between the construct and other constructs in the model (i.e., the squared correlation

between two constructs). Table 4 shows that all constructs have discriminant validity because all correlations are lower than the square root of variances extracted. Further, the last part of Table 4 shows that the correlations between each first-order construct and the second-order construct is >0.707 indicating that they have more than half their variance in common (MacKenzie, Podsakoff, and Podsakoff, 2011).

PLACE TABLE 4 ABOUT HERE

Structural results. Table 5 shows the results of the structural model and corresponding hypotheses tests. The two-step score construction procedure was employed to test the hypotheses (Chin, Marcolin, and Newsted, 2003). The PLS approach allows explicit estimation of latent variable (LV) scores; after saving the standardized LV scores (Tenenhaus et al., 2005). A nonparametric bootstrapping procedure with 500 re-samples was performed to obtain the path coefficients, their respective standard errors, and t-values for their path coefficients (Fornell and Larcker, 1981). All path coefficients are significant at the 0.001, 0.01 or 0.05 level, except for the “experience→behavioural intention” relationship for both music conditions and the “memory→behavioural intention” relationship for the condition without music.

The Q^2 -statistic (i.e., the Stone–Geisser test) can be used to evaluate the predictive relevance of the model. All Q^2 -values are positive. Therefore, the relationships in the model have predictive relevance for both music groups. The model also demonstrates a high level of predictive power (R^2). The modelled constructs explain 47.5% of the variance in behavioural intention in the case without music and 51.3% of the variance in behavioural intention in the case with music. It is noteworthy that the model explains 72.3% of the variance in memory for the condition with music. The overall goodness of fit (GoF; Tenenhaus et al. 2005) exceeds the required threshold of 0.36, as suggested by

Wetzels, Odekerken-Schröder, and van Oppen (2009), indicating a good fit. Even so, the model fits better in the condition with music.

PLACE TABLE 5 ABOUT HERE

We also analysed the mediating effects by using the bootstrapping procedure to test for indirect effects (Preacher and Hayes, 2008; Williams and MacKinnon, 2008). Following Chin (2010), a two-step procedure was employed within the PLS approach: we first used the models without and then with the mediators. We performed 500 bootstrap re-samplings. The significance of the indirect effects was estimated using percentile bootstrap, which generated a 95% confidence interval (CI) for the indirect paths (Williams and MacKinnon, 2008). If the interval for an indirect path does not contain zero, it means that the indirect effect is significantly different from zero with 95% confidence. As seen in Table 6, the intervals do not contain zero for any case, rendering pleasant arousal and memory as mediators.

The direct effect of experience on behavioural intentions is significant without the mediators in the music presence and absence condition. When introducing the mediators (one by one and both together) the direct effect loses importance and the indirect effects become significant, indicating that pleasant arousal and memory partially mediate the “experience→behavioral intentions” path in both music conditions. The variance accounted for (VAF) provides a measure for the degree of partial mediation and is normed between 0% and 100% (Helm, Eggert, and Garnefeld, 2010). Regarding the indirect effect from experience on behavioural intentions through memory, the VAF values are higher in the music presence versus absence condition while the contrary is true for the indirect effect from experience on behavioural intentions through pleasant arousal. These findings reflect the favourable memory and unfavourable evaluation effect of music (see Table 6).

PLACE TABLE 6 ABOUT HERE

Finally, the path differences between the samples of art galleries with and without background music were compared by conducting t-tests according to Chin and Dibbern (2010). The test results are presented in Table 7, showing that the difference between the two conditions (with and without background music) for the relationship “pleasant arousal→behavioural intentions” is in the expected direction significant at $p = 0.062$; therefore tentatively supporting H9a. The results of Table 7 further show, as hypothesized, a significant difference ($p = 0.035$) between the two conditions for the relationship between memory and behavioural intentions, supporting H9b.

PLACE TABLE 7 ABOUT HERE

Discussion of Study 2

Overall, the art gallery experience facilitates behavioural intentions via pleasant arousal and memory. These findings are in line with previous research, demonstrating the positive influence of experiences on developing emotions (e.g., Hirschman and Holbrook, 1982; Silvia, 2005; Bourgeon-Renault et al., 2006) and memories (Dolcos and Cabeza, 2002). The stimuli of paintings (artworks) and their display in the art gallery together with the pleasure of contemplating the whole scenery contribute to creating memories.

The intention to recommend and encourage others to visit the art gallery is a function of pleasant arousal and memories. Indeed, pleasant arousal is a mediator between experience and behavioural intentions. In this vein, the positive emotions felt during the experience are the key to open new links in memory which, in turn, lead visitors to act as advocates of the art gallery.

As in Study 1, we observe that music facilitates effects linked with memory and hampers effects related to cognitive appraisal. Specifically, background music was shown to foster the link between memory and behavioural intentions. It seems that music helps visitors to encode the information provided by stimuli (Banbury et al., 2001; Choi, Lee,

and Li, 2013) and induces them to encourage others to visit the art gallery. In addition, we found that music has a tendency to attenuate the link between pleasure arousal and behavioural intentions.

Overall Discussion

Theoretical Discussion

Art galleries are marked by purposeful elimination of other stimuli in order to reduce distraction and allow the consumer to focus on the artwork itself. The absence of atmospheric stimulation makes art galleries different from service and retail environments, which often build on purposeful enhancement of atmospheric stimulation in order to foster the shopping experience. The investigation of background music within the setting of art experience allows us to advance literature in two ways.

First, we assume that in the art context, where consumers' focus is directed to the contemplation of art, other atmospheric elements would be distracting. In both studies, our assumption was supported and the findings show music as an unfavourable stimulus when it comes to evaluation of art (Study 1) and to emotional appraisal of the artwork experience (Study 2). As such, these findings are in contrast to the general atmospherics literature, where music causes positive effects on customers' shopping behaviour (Roschk, Loureiro, and Breitsohl 2017). One of the few exceptions, which also provides contrary findings, comes from Hynes and Manson (2016). Their qualitative results suggest that music in a supermarket is perceived as a distraction. Another indication in terms of colour schemes is provided by van Rompay et al. (2012), who found that task-oriented shoppers prefer a less-arousing environment over a more-arousing one. Linking our results to the conceptualization of the value of the artwork experience, it appears that music distracts from the emotional interaction and the beauty that are associated with the

artwork. In terms of flow, music may overstress the skills that are already needed for the interpretation of the artwork.

Second, we introduce memory to the investigation of background music, which has so far been ignored. Our results show background music as a beneficial atmospheric element supporting the memorization process, either in the form of better recall of the presented paintings (Study 1) or as a facilitator of the link from memory to behavioural intentions (Study 2). Beneficial memory effects in terms of recall and recognition have also been reported for music's influence on the effectiveness of the advertising message (Kellaris, Cox, and Cox, 1993; Meyers-Levy and Zhu, 2010) and when it comes to an atmospheric stimulation via scent (Mitchell, Kahn, and Knasko, 1995; Morrin and Ratneshwar, 2003). As such, our results provide supporting links to two neighbouring research streams: advertising effectiveness, which is likewise concerned with music effects, and atmospheric scent, which is concerned with an alternative ambient stimulation. With regards to atmospheric music research, interesting findings also come from Chebat, G  linas-Chebat, and Vaillant (2001), who show that cognitive activity, which may be seen as a correlate of memory, can be fostered by background music. For the theoretical development of art literature, our results suggest that the memorability of an artwork may be considered as a novel element for the value of the artwork experience that has received not much attention in present conceptualizations. In a related vein, Hernando and Campo (2017b) suggest that the artists' enduring impact over time constitutes a factor for the artists' perceived value.

Managerial implications

Galleries integrate the artist into the society's economy and by doing so add commercial value to the artwork. This study provides evidence that a judicious management of the

galleries' ambience may support this objective. Hereby, background music, as part of the sensual component of the artwork experience, may enhance consumers' intentions to recommend and encourage others to visit the art gallery and helps visitors to memorize the whole experience. It further can even influence positive emotions and those, in turn, act as a mediator between the art gallery experience and intentions to recommend the gallery to others. In this vein, art gallery managers can benefit from using background music in their art gallery. Background music as individual stimulus, however, needs to be selected carefully. The music should match the artwork style, without being a stronger stimulus than the stimulus of viewing art, and it should be a complement to help the process of memorizing artworks, thus enhancing the possibilities of recommending a visit.

Actually, the match between music and artwork styles is a core factor to get favourable appraisal of the artwork. When this match does not happen, it may cause unfavourable appraisal. However, when we think about the possibility to buy or recommend artwork to others, music has a positive and important role on creating memories in visitors' mind. Visitors may not buy the artwork at the first visit but may be more open to visiting the art gallery again due to remembering a certain piece of art.

Limitations and further research

Although we conducted the studies carefully, we acknowledge several limitations which may be suggestions for further research. First, we tested the effect of background music but more studies are needed to analyse different senses and their interactions, in order to better understand the impact of ambient stimuli on the perception of art. Second, the second study was conducted in real art galleries, considering different styles of art and different background music, but more data should be gathered in real galleries to extend

the applicability of the findings, which may for instance reveal cross-cultural similarities or differences (Gelbrich, Roschk, and Eisend 2015). Third, further research should consider several varieties of music tempos in order to understand which tempo fits better with certain types of art in order to foster memorization without compromising evaluation of the paintings. The data of our first study provided indications for this suggestion by showing a slight but not significant tendency that calm music yielded better recall values than stirring music. In addition to memory effects, music and its properties may also help to understand and direct visitors' movements within art facilities (Tröndle 2014). Fourth, the present research considers only pleasant arousal as an internal state of mind. Future research may test for other concepts such as flow to find whether music facilitates or hampers these internal states that are potentially desirable for the contemplation of art.

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Figure 1. Examples of paintings by Vieira da Silva (left) and Paula Rego (right)



Table 1. Control factors, art evaluation, experience evaluation and art memory in different background music conditions for Study 1

<i>Control factors</i>	Without music		Sunny (stirring)		Starlight Memories (calm)		test[df]	<i>p</i>
	M	SD	M	SD	M	SD		
Age (years)	45.80	25.08	48.90	23.81	46.60	23.80	F = 0.34 [2, 226]	0.71
Noise sensitivity	-	-	20.20	4.86	19.80	5.24	t = 0.55 [164]	0.58
Knowledge of artists (%)	59.10		51.80		37.30		$\chi^2 = 11.20$ [6]	0.08
Perception of artists' styles (%)	65.20		67.90		80.20		$\chi^2 = 5.68$ [4]	0.22
Perception of background music (%)	-		94.10		97.50		$\chi^2 = 5.65$ [2]	0.06
<i>Art evaluation</i>	M	SD	M	SD	M	SD	F[df]	<i>p</i>
Arousal	2.90	0.73	2.80	0.72	2.60	0.63	3.24 [2, 231]	0.04*
Valence	2.70	0.67	2.60	0.63	2.40	0.60	3.86 [2, 231]	0.02*
Liking	2.80	0.68	2.70	0.65	2.50	0.63	4.71 [2, 231]	0.01*
Overall experience evaluation	3.60	0.99	3.40	1.14	3.30	1.07	1.32 [2, 227]	0.27
<i>Art memory</i>	M	SD	M	SD	M	SD	χ^2 [df]	<i>p</i>
Total	68.80	25.44	74.70	21.69	78.50	20.82	6.74 [2]	0.03*
Paula Rego	76.70	22.02	83.10	27.19	87.30	21.43	16.47 [2]	0.00***
Vieira da Silva	61.00	33.15	66.30	22.74	69.70	27.06	2.96 [2]	0.23

Note: Noise sensitivity was measured using the NSS-SF scale, where higher scores indicate greater sensitivity. Knowledge of artists is the percentage of participants who correctly identified one or both of the artists. Arousal, valence, and liking were rated on 5-point scales. * $p < .05$, ** $p < .01$, *** $p < .001$

a. Adjusted percentage score. M-mean, SD-Standard Deviation

Table 2. Comparison between with and without music conditions of art evaluation and art memory for Study 1

	Without music		With music		t [df]	p
	M	SD	M	SD		
<i>Art evaluation</i>						
Arousal	2.9	0.727	2.7	0.678	2.078 [232]	0.039*
Valence	2.7	0.674	2.5	0.621	2.210 [232]	0.028*
Liking	2.8	0.679	2.6	0.640	2.637 [232]	0.009**
<i>Art memory</i>						
Total	68.8	25.440	76.6	21.291	-2.193 [103]	0.031*
Paula Rego	76.7	22.023	85.2	24.533	-2.449 [232]	0.015*
Vieira da Silva	61.0	33.146	68.0	24.951	-1.556 [95]	0.123

Arousal, valence and liking were rated on 5-point scales. * $p < .05$, ** $p < .01$.

a. Adjusted percentage score. M-mean, SD-Standard Deviation

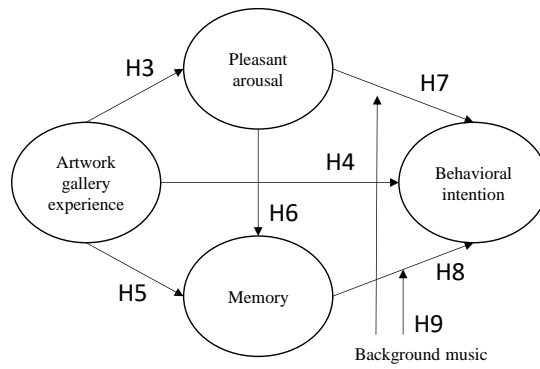
Figure 2. Proposed model for study 2

Table 3. Measurement results for Study 2

Latent variable	Item	Without music			With music		
		M (SD)	Item loading (Reflective measure)	CR	M (SD)	Item loading (Reflective measure)	CR
Sensory	This art gallery makes a strong impression on my visual sense or other senses.	3.8 (0.998)	0.837	0.877	3.7 (0.818)	0.860	0.898
	I find this art gallery interesting in a sensory way.	3.6 (1.083)	0.870		3.9 (0.986)	0.840	
	This art gallery does not appeal to my senses (r)	2.2 (1.218)	0.810		2.1 (1.141)	0.890	
Intellectual	I engage in a lot of thinking when visiting this art gallery.	3.9 (0.866)	0.709	0.835	3.6 (1.096)	0.708	0.896
	This art gallery does not make me think.(r)	2.5 (1.345)	0.845		1.9 (1.051)	0.906	
	This art gallery stimulates my curiosity and learning.	3.9 (0.867)	0.848		3.5 (0.945)	0.896	
Pleasant Arousal	My visit here was interesting	4.1 (0.822)	0.744	0.849	3.9 (1.018)	0.848	0.928
	My visit here was enjoyable	4.1 (0.973)	0.748		4.0 (1.014)	0.883	
	My visit here was exciting	3.9 (0.815)	0.800		3.5 (0.836)	0.830	
Memory	My visit here was stimulating	3.7 (0.907)	0.763	0.861	3.6 (0.949)	0.931	0.900
	I have wonderful memories about this art gallery	3.9 (1.028)	0.708		3.4 (1.022)	0.707	
	I won't forget my experience at this art gallery	3.9 (1.028)	0.878		3.4 (1.022)	0.904	
	I will remember many positive things about this art gallery	3.6 (0.962)	0.860		3.4 (0.890)	0.905	
B. Intention	I will speak well about this art gallery to other people	4.1 (0.802)	0.712	0.794	4.0 (1.186)	0.813	0.887
	I will recommend this art gallery if someone asks for my advice	4.1 (0.700)	0.822		3.8 (1.019)	0.889	
	I will encourage my friends and relatives to visit this art gallery	3.8 (1.071)	0.713		3.4 (1.121)	0.847	
	<i>Second order formative construct</i>		<i>First-order constructs/Dimensions</i>		<i>Weights</i>	<i>t-value</i>	<i>VIF</i>
Without music	Artworks gallery experience		Sensory		0.807***	13.384	1.130
			Intellectual		0.388***	6.579	1.130
With music	Artworks gallery experience		Sensory		0.637***	23.760	2.027
			Intellectual		0.470***	18.097	2.027

r: reverse coded, CR: composite reliability; Note: Significant at ***p < 0.001

Table 4. Convergent and discriminant validity for Study 2

Construct	AVE	1.	2.	3.	4.	5.
Without music						
1.Sensory	0.705	0.839				
2.Intellectual	0.717	0.318	0.846			
3.P. Arousal	0.584	0.587	0.562	0.764		
4.Memory	0.756	0.593	0.258	0.647	0.869	
5.B. Intention	0.564	0.486	0.356	0.684	0.441	0.751
Correlation between first and second-order construct						
	Sensory		Intellectual			
Experience	0.930		0.744			
With music						
1.Sensory	0.746	0.863				
2.Intellectual	0.812	0.625	0.901			
3.P. Arousal	0.764	0.707	0.782	0.874		
4.Memory	0.818	0.704	0.745	0.821	0.904	
5.B. Intention	0.723	0.573	0.583	0.685	0.675	0.850
Correlation between first and second-order construct						
	Sensory		Intellectual			
Experience	0.930		0.868			

Notes: AVE: average variance extracted. Values on the diagonal (in bold) represent the square root of AVE. Lower diagonal values indicate factor correlations.

Table 5. Structural results for Study 2

Path	Standardized Coefficient	t-value	Standard error (SE)	Test results
Without music				
Experience → P. Arousal	0.696***	11.543	0.060	H3: Supported
Experience → B. Intention	0.122 ns	0.887	0.137	H4: Not supported
Experience → Memory	0.256**	2.542	0.101	H5: Supported
P. arousal → Memory	0.469**	4.446	0.106	H6: Supported
P. arousal → B. Intention	0.619***	5.338	0.116	H7: Supported
		0.270	0.112	H8: Not supported
Memory → B. Intention	-0.030 ns			
R ² P. Arousal	0.484		Q ² P. Arousal	0.278
R ² Memory	0.453		Q ² Memory	0.319
R ² B. Intention	0.475		Q ² B. Intention	0.240
GoF (overall goodness of fit)	0.619		f ² (effect size)	1.518
With music				
Experience → P. Arousal	0.817***	24.590	0.033	H3: Supported
Experience → B. Intention	0.125 ns	0.141	0.145	H4: Not supported
Experience → Memory	0.382***	4.123	0.093	H5: Supported
P. Arousal → Memory	0.509***	5.832	0.087	H6: Supported
P. Arousal → B. Intention	0.340 **	2.394	0.142	H7: Supported
Memory → B. Intention	0.296*	2.068	0.143	H8: Supported
R ² P arousal	0.668		Q ² P. arousal	0.505
R ² Memory	0.723		Q ² Memory	0.563
R ² B. Intention	0.513		Q ² B. Intention	0.350
GoF (overall goodness of fit)	0.737		f ² (effect size)	2.650

Notes: Significant at: *p < 0.05, **p < 0.01 and ***p < 0.001; ns: not significant.

Table 6. Mediation analysis for Study 2

	Direct effect	Indirect effect	Total effect	VAF	Percentile 95% CI		Explained variance
					Lower	Upper	
Without music							
Experience → B. Intention (without mediation)	0.536*** (t=6.671)	-	0.536*** (t=6.671)	-	-	-	R ² _{B.intention} =28.7%
Experience → B. Intention Memory mediator	0.402*** (t=3.195)	0.134ns (t=1.925)	0.536*** (t=6.503)	25.0% partial mediation	0.132	0.158	R ² _{Memory} =34.7% R ² _{B.intention} =32.0%
Experience → B. Intention P. Arousal mediator	0.110 ns (t=0.962)	0.425*** (t=5.968)	0.535*** (t=6.718)	79.5% Partial mediation	0.418	0.444	R ² _{P. Arousal} =49.3% R ² _{B.intention} =47.3%
Experience → Memory P. Arousal mediator	0.256*** (t=0.962)	0.327*** (t=4.329)	0.579*** (t=10.414)	56.5% Partial mediation	0.324	0.352	R ² _{P. Arousal} =48.4% R ² _{Memory} =45.5%
Experience → B. Intention Memory and P. Arousal as mediators	0.122 ns (t=1.018)	0.412*** (t=5.423)	0.534*** (t=6.365)	77.1% Partial mediation	0.398	0.426	R ² _{Memory} =45.3% R ² _{P. Arousal} =48.4% R ² _{B.intention} =47.5%
With music							
Experience → B. Intention (without mediation)	0.641*** (t=11.196)	-	0.641*** (t=11.196)	-	-	-	R ² _{B.intention} =41.1%
Experience → B. Intention Memory mediator	0.278* (t=2.025)	0.362*** (t=3.412)	0.640*** (t=11.090)	56.6% Partial mediation	0.341	0.381	R ² _{Memory} =63.6% R ² _{B.intention} =48.4%
Experience → B. Intention P. Arousal mediator	0.231ns (t=1.650)	0.409*** (t=3.565)	0.640*** (t=10.826)	63.9% Partial mediation	0.379	0.423	R ² _{P. Arousal} =66.8% R ² _{B.intention} =49.2%
Experience → Memory P. Arousal mediator	0.382*** (t=4.322)	0.417*** (t=5.939)	0.579*** (t=10.414)	72.0% Partial mediation	0.408	0.434	R ² _{P. Arousal} =66.8% R ² _{Memory} =72.3%
Experience → B. Intention Memory and P. Arousal as mediators	0.125 ns (t=0.862)	0.515*** (t=4.605)	0.640*** (t=10.755)	80.5% Partial mediation	0.491	0.535	R ² _{Memory} =72.3% R ² _{P. Arousal} =66.8% R ² _{B.intention} =51.3%

Notes: Significant at: *p < 0.05, **p < 0.01 and ***p < 0.001; ns: not significant.

Table 7. Multi-group analysis for Study 2

Structural path	Standard Error Without music	Standard Error With music	$\beta_{\text{without music}} - \beta_{\text{with music}}$	S	t-test	P
Experience → P. Arousal	0.060	0.033	-0.121	0.516	-1.729*	0.043
Experience → B. Intention	0.137	0.145	-0.003	1.464	-0.015	0.494
Experience → Memory	0.101	0.093	-0.126	1.014	-0.916	0.180
P. Arousal → Memory	0.106	0.087	-0.040	1.018	-0.290	0.386
P. Arousal → B. Intention	0.116	0.142	0.279	1.336	1.540	0.062
Memory → B. Intention	0.112	0.143	-0.326	1.321	-1.819*	0.035

Note: * $p < 0.05$