Impact of Mediation devices on the Museum Visit Experience and on Visitors' Behavioural Intentions

Elodie Jarrier, Dominique Bourgeon-Renault

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Introduction

The purpose of this article is twofold: to explore the components of the museum experience with mediation devices (audio guides, interactive terminals, SmartPhones, touch-screen tablets, augmented reality, etc.); and to identify visitors' behavioural intentions, including their intention to return to a museum. We opted to direct our research specifically at fine art museums. To the best of our knowledge, little research has been done on the impact of mediation devices during museum visits in this context. Does the use of such devices influence the visiting experience and visitors' behavioural intentions, and if so, what components of the experience are involved?

In theoretical terms, in order to account for the museum experience, we draw on the experiential strand of research (Holbrook and Hirschman, 1982). Research in this strand emphasizes the quest to produce meaning through the consumption of culture and the importance of its symbolic, hedonic and aesthetic aspects. Such research also calls into question the theory of cultural legitimacy (Bourdieu, 1979), according to which the consumption of culture reveals the individual's intention to affirm his or her social standing. Indeed, the level of analysis of the experiential strand is the individual. Extending the experiential approach, Falk (2009) considers museum visits to be a resource through which the visitor can take on different temporary identities (explorer, experience-seeker, facilitator, fan, regenerator) that may vary during the course of a single experience or from one visit to another.

In managerial terms, the aim is to advise museum professionals on how to use various devices (the Internet, audio guides, interactive terminals, videos) so as to define their strategic positioning with respect to their visitors and to give patrons an incentive to visit more often.

In the first part of the article, we present our theoretical framework and examine the impact of mediation devices on visitor behaviour, whatever the type of museum. In the second part, after briefly describing our methodological approach, we explore the results of our research relating to the impact of mediation devices on the experience of visiting a fine art museum and on visitors' behavioural intentions. We make a number of recommendations for managers before concluding with the limitations of the study and suggested areas for future research.

Theoretical Framework

First we present the theoretical context of the experience of visiting a museum. Then we look more broadly at the impact of interactivity on the visitor experience, regardless of the type of museum.

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Conceptual and Theoretical Principles

Many attempts have been made to classify mediation devices for museums. These devices have been identified in turn by:

- their nature or location (static or mobile)
- their objective
- their level of interactivity (high or low)
- the type of museums they serve
- their impact on social ties (Adams, Luke and Moussouri, 2004)
- their multimedia or immersive character (Collin-Lachaud and Passebois, 2006, 2008)
- their capacity to enhance the *in situ* or off-site experience (Stogner, 2009)
- their orientation towards visitors (entertainment is the primary objective) or towards curators (learning is the primary motive) (Pallud and Kéfi, 2011)

In our study we look at mediation devices that can digitally enhance, whether individually or collectively, *in situ* visits to fine art museums. We consider fixed devices (especially interactive terminals and multi-touch tablets) and mobile devices (audio guides, SmartPhones, touch-screen tablets), which may also use technologies related to 3D or augmented images. Some of these devices may be connected to the Internet. Our study addresses the concerns of not only museum managers but also the French Ministry of Culture and Communications (which in 2012 called for innovative projects, particularly those involving digital devices at heritage sites and museums). All of these actors are concerned with the impact of mediation devices on the visitor experience and on attendance figures for cultural institutions.

The museum visit, like any consumer experience, has four stages (Arnould, Price and Zinkhan, 2002): anticipation, purchase, the actual experience and recollection. The central aim of this study is to look at the impact of mediation devices on the last two stages – the actual experience and its extension (memory) – in a fine art museum. The experience is described as an individual, cumulative process that is part of an experiential context and over which the individual or enterprise exercises varying levels of control (Carù and Cova, 2006). Even so, museum visits with or without devices have a number of specific features that can be apprehended by the experiential approach.

In the context of a "traditional" or autonomous *in situ* visit, the individual may seek different types of museum experiences that are not mutually exclusive (Pekarik, Doering and Karns, 1999): experience of the object, a cognitive experience, an introspective and intimate experience, and/or a social experience.

As part of a museum visit with mediation devices, visitors have different experiences depending on the devices, whatever the type of museum:

- Audio guides and interactive terminals offer a learning experience by providing basic contextual components to increase the visitor's understanding (Deshayes, 2004).
- Online videos stimulate the clash of opinions and produce "waking dreams" and the experience of memory (Tussyadiah and Fesenmaier, 2009).
- Videos and mobile phones allow some users to experience "enchantment" (McCarthy et al., 2006).
- Touch-screen tablets fitted with RFID chips and multi-user touch-screen tablets with

ABSTRACT

This study draws on the experiential approach and has two main goals: to explore the different dimensions of the museum experience regardless of whether it is mediated by mediation devices (e.g., audio guides, interactive terminals, SmartPhones, tablets, augmented reality), and to identify the impact of such devices on visitors' behavioural intentions. The authors conduct a qualitative and exploratory investigation to address the following questions: Does the development of such devices affect both experience dimensions and the audience's behavioural intentions? Which components of a museum visit are concerned?

KEYWORDS

Experience, museums, *in situ* visit, online visit, information and communication technologies

augmented reality have varied effects, based on the age, knowledge and emotions of the individual, time spent and social interactions. They can lengthen the visit and make it more sociable and enjoyable, facilitate parent-child exchange and facilitate reading at different levels (Gagnebien et al., 2011).

– Museum Internet sites function like brand sites – that is, the experience stages the virtual experience of the brand (Carù and Cova, 2006). They are also similar to "Internet presence" sites (Hoffman, Novak and Chatterjee, 1995), which are designed to promote the institution and attract visitors to the physical museum.

The Impact of Mediation Devices on the Museum Visit Experience

Mediation devices have the potential to make museums more attractive and to be an intrinsic motive for the visit – for loyal visitors and newcomers alike (Adams, Luke and Moussouri, 2004). What are the reasons for this? The literature shows that mediation devices influence both the actual experience and the visitor's behavioural intentions, although the connection between the two concepts is moderated by the visitor's level of expertise.

Mediation devices and the museum experience

The use of mediation devices during an *in situ* visit, whatever the type of museum, exerts an influence emotionally, rhetorically, cognitively, praxeologically (connections with others and appropriation of the place and space) and temporally.

Emotionally, these devices make it possible to put oneself in the shoes of historical characters and to have one's senses and emotions stimulated (Pallud and Monod, 2010).

In rhetorical terms, mediation devices enable visitors to project themselves and engage emotionally, so that they can perceive the influence of history on today's world, give meaning to the exhibition and better understand themselves (Pallud and Monod, 2010).

In cognitive terms, "used thoughtfully and in the appropriate context, interactives can facilitate learning" (Adams, Luke and Moussouri, 2004, p. 160). These devices are also useful in history museums since they can provide the contextual elements that one needs in order to experience the past (Pallud and Monod, 2010). However, it should be kept in mind that although children may be attracted to computers, it is not necessarily for the purpose of learning. Debenedetti, Krebs and Caro (2007) point out that children sometimes remember the manipulations needed to operate a device better than the information about the artwork or the theme of the exhibition.

In terms of praxeology, mediation devices have an ambiguous effect. They may respond to a specific need expressed by visitors who "are not only looking for technical interactivity but also for social interactivity with others" (Adams et al., 2004). However, the individual's involvement with a mediation device during the visit weakens the connection with other members of the group (vom Lehn and Heath, 2005). And while they spark visitors' interest and make it easier for them to locate objects (Adams, Luke and Moussouri, 2004), mediation devices do not necessarily allow all visitors to make the exhibition's contents their own. According to Belaën (2005), there are five possible reactions to immersive museography in

RÉSUMÉ

Cette recherche s'appuie sur l'approche expérientielle et présente deux objectifs. Tout d'abord, nous explorons les différentes dimensions de l'expérience muséale, qu'elle soit influencée ou non par des outils de médiation interactifs (audio guides, terminaux interactifs, téléphones intelligents, tablettes, réalité augmentée, etc.). Puis nous étudions l'influence de ces outils sur les intentions comportementales des visiteurs. Dans le cadre de cette recherche, une étude qualitative et exploratoire a été menée afin de répondre aux questions suivantes: le développement de ces outils affecte-t-il les dimensions de l'expérience de visite muséale et les intentions comportementales du public? Quelles sont alors les composantes de la visite muséale concernées?

MOTS CLÉS

Expérience vécue, musées, visite in situ, visite en ligne, outils de médiation interactifs

a science museum, ranging from making the museum one's own to fully rejecting it. These five reactions are as follows: resonance (complete adhesion to the devices); submersion (becoming emotionally steeped in the experience, with no distancing); critical distancing; banalization; and rejection. Only with the resonance reaction does the visitor become wholly involved in appropriating the experience, which is facilitated by interactive mediation.

In terms of time, vom Lehn and Heath (2005) warn that more time spent in the museum because of the presence of mediation devices does not necessarily indicate a higher-quality experience. Vom Lehn and Heath explain that although the time spent increases significantly when visitors use interactive devices, the more technologically advanced the device, the more one's attention is drawn away from the actual object on display.

The museum experience and visitors' behavioural intentions

Loyalty to a museum is said to take many forms. It might manifest as a strong, lasting and unobservable bond ("true" loyalty), despite the possibility of chronic dissatisfaction (Passebois, 2003). The level of expertise moderates this type of intention, since the level of consumer intention (loyalty) increases with the level of expertise (Passebois, 2003). In this respect, we are unaware of any research specifically examining the impact of mediation devices on loyalty and behavioural intentions.

We studied the influence of mediation devices (the Internet, audio guides, interactive terminals, videos, etc.) on visits to fine art museums and measured their impact on intentions to frequent this type of museum in the future. We formulated the following proposition relative to the foregoing developments: Relations between, on the one hand, *use of mediation devices and experience,* and, on the other, *experience and behavioural intentions,* may vary with the type of museum. The objectives of the use of devices, which may vary with the museum context, are as follows: to develop didactics and pedagogy in science museums, to promote reconstruction and contextualization in archaeological or history museums, to facilitate education, and to elicit feeling and encourage aesthetic contemplation in fine art museums. For some individuals, these devices have a legitimate place in a heritage context: *Places like Chambord...do not relate history on their own, unlike an artwork, which you can usually try to interpret alone. For science museums it might be different because the things you see are applied in a specific area that may not be clear to us, so it's important to have more explanation. The artwork is there, even if no context is given* (V.C., regular visitor). Conversely, when one is seeking a specific aesthetic experience the presence of technological devices among artworks may be viewed as *interference* (M.F., regular visitor).

The Impact of Mediation Devices During a Visit to a Fine Art Museum

In this section we explore textual data from our semi-directive interviews. For this we adopt a qualitative approach. The semi-directive exploratory interviews were conducted face-to-face from mid-December 2011 to early February 2012 with a convenience sample (Table 1) of 21 respondents (9 men and 12 women). Women are slightly over-represented in the sample, reflecting a trend in the French museumgoing population (Donnat, 2011). Other sociodemographic and individual characteristics are shown in Table 1. Of the respondents, 3 were non-visitors, 5 were occasional visitors and 13 were

RESUMEN

Esta investigación se basa en el método experimental y presenta dos objetivos. En primer lugar, exploramos las diferentes dimensiones de la experiencia museológica, sea o no influenciada por herramientas interactivas de mediación (guías audio, terminales interactivos, tabletas, realidad aumentada, etc.). Luego, estudiamos la influencia de estas herramientas sobre las intenciones de comportamiento de los visitantes. En el marco de esta investigación, se llevó a cabo un estudio cualitativo y exploratorio con el fin de dar respuesta a las siguientes preguntas: ¿ Tiene el desarrollo de estas herramientas algún impacto sobre las dimensiones de la experiencia de visita a un museo y las intenciones de comportamiento del público? ¿Cuáles son entonces los componentes de la visita de museo implicados?

PALABRAS CLAVE

Experiencia vivida, museos, visita in situ, visita en línea, soportes interactivos de mediación

TABLE 1

SAMPLE

Name	Sex	Year of birth	Region	Occupation	Years of higher education (bac +)	Visiting frequency	Device user	Duration
M.L.	F	1985	Burgundy	PR officer	5	Occasional	No	23.34
J.A.	F	1946	Burgundy	Retired	8	Regular	Yes	48.16
A.L.	F	1981	Burgundy	Student	6	Regular	Yes	34.30
S.G.	F	1973	Burgundy	Research technician	8	Regular	No	30.17
T.B.	F	1984	Burgundy	Student	6	Occasional	Yes	28.55
M.F.	F	1981	Burgundy	Lawyer	8	Regular	No	29.23
C.B.	F	1986	Burgundy	Student	6	Regular	Yes	37.26
M.R.	M	1973	Burgundy	Program officer	2	Regular	No	21.44
S.M.	F	1979	Burgundy	PR officer	4	Occasional	No	31.07
G.P.	F	1974	Burgundy	Accountant	2	Regular	Yes	26.04
V.C.	M	1981	Burgundy	Artist	5	Regular	No	31.45
J.S.	M	1984	Burgundy	Student	1	Non-visitor	No	25.43
M.R.	F	1946	Burgundy	Retired	5	Regular	Yes	17.05
M.J.	M	1950	Burgundy	Retired	1	Non-visitor	Yes	40.17
K.B.	F	1985	Burgundy	Student	6	Occasional	No	16.41
L.B.	M	1990	Burgundy	High-school pupil	N/A	Occasional	No	16.00
M.-J.T.	F	1950	Burgundy	General practitioner	8	Regular	No	47.52
G.C.	M	1981	Paris	Artistic director	3	Regular	Yes	63.00
F.B.	M	1966	Paris	Piano teacher	0	Regular	Yes	47.25
L.P.	M	1989	Midi-Pyrenees	Student	4	Regular	Yes	90.00
B.V.	M	1986	Paris	Adviser	5	Non-visitor	No	50.30

regular visitors. Individuals are distinguished by their level of expertise for two reasons: the moderating role of expertise in the connection between experience and behavioural intentions is underscored by Passebois (2003); and it is usual to allow for this variable in research commissioned by the Ministry of Culture and Communications, especially that concerning free admission to museums and monuments (Gombault et al., 2006). Thus we considered non-visitors to be people who have not visited a museum for at least five years, occasional visitors those who have been to a museum at least once in the last five years and at most twice in the last year, and regular visitors those who have been to a museum more than twice in the last year. Moreover, although this is a convenience sample, the proportion of mediation device users and non-users was controlled, with the sample composed of 10 users and 11 non-users. The interviews were audiorecorded, transcribed and analyzed manually. The interview guide

(Table 2) comprises three themes: (1) profile, cultural preferences and habits; (2) knowledge of, interest in and familiarity with new technologies; and (3) perception of the presence of mediation devices and their possible impact on the experience.

Content analysis was based on an intra- and inter-interview manual thematic analysis: "the categories (or classes) used for codifying data are pre-determined by the investigator" (Jourdan and Jolibert, 2006, p. 59).

We identified themes and "verbatims" for the two phases of the experience: the actual visit and its extension (recollection and behavioural intentions). For the actual experience, we identified verbatims in connection with each of the dimensions of the experience and in terms of behavioural intentions (with or without mediation devices). The verbatims converge with the dimensions identified by Roederer (2008): emotion (hedonic-sensorial component), jointly constructed senses of the visit (rhetorical component), actions performed during the course of the activity, interactions with companions (praxeological component) and time management of the activity (temporal component).

First we present the results relating to the components of the actual experience, with or without the use of devices. Then we look at the consequences of the experience (recollection and behavioural intentions). Lastly, we discuss the managerial implications of our research.

TABLE 2

IMPACT OF THE USE OF INTERACTIVE DEVICES ON THE MUSEUM VISIT

Authors	Dimension of the experience
vom Lehn and Heath (2005)	Attention to artworks and time spent
Hein (1998) Adams, Luke and Moussouri (2004) Falk et al. (2004) vom Lehn and Heath (2005) Debenedetti, Krebs and Caro (2007) Pallud and Monod (2010)	Learning
Pallud and Monod (2010)	Knowledge of the past and of oneself
Adams, Luke and Moussouri (2004) vom Lehn and Heath (2005)	Social connection

Components of the Experience With or Without Mediation Devices

The respondents all recounted their most recent visit to a fine art museum. Their accounts suggest several components: cognitive, emotional, social, environmental and temporal.

Hedonic-sensorial dimension

For the physical visit (without mediation devices) our results converge with those of earlier research (Bourgeon et al., 2005) and confirm that the museum visit may elicit positive emotions or feelings as varied as pleasure, aesthetic shock, imagination, admiration, relaxation, serenity, calm, astonishment, surprise, intellectual interest, identification with the work, abstraction or immersion. Negative feelings were also expressed; these include fatigue, saturation, oppression, distaste, disappointment, incomprehension and irritation.

For the actual visit to a fine art museum with mediation devices, the accounts suggest that the audio guide elicits more negative emotions than positive. The respondents criticized the visit as being no fun and even monotonous: *I find the narration is often very monotonous* (F.B., regular visitor), *especially if it is automated or pre-recorded* (L.P., regular visitor). Interactive terminals were also perceived as unattractive, *outdated* (G.C., regular visitor), *no fun,* no better than an online visit from home: *[Since] there's no contact with the artwork, you can have the same [relationship] by going on the Internet at home, to be blunt* (F.B., regular visitor). The SmartPhone, although much preferable to these devices, can inhibit such emotions as aesthetic pleasure because one has to pay attention simultaneously to the artwork and the technical medium (the screen). However, touch-screen tablets are perceived as more readable, brighter, more convivial and thus more satisfactory. Even so, audio guides, SmartPhones and touch-screen tablets are generally considered to elicit less intense emotion than a guided tour, which is *livelier* (B.V., non-visitor). For G.C. (regular visitor), the use of devices does not reinforce emotions intrinsically related to the artwork: *I don't think I would be more emotional using those devices...because when you're in a museum what produces the emotional response are the artworks – it is not seeing them in 3D or*

virtually. Conversely, the emotions generated by these devices are indirect and mediated by the understanding of the works (rhetorical component): *We discover things more, so we appreciate [the works] more. The more you understand a painting, the more you like it. It changes our emotions. There's a balance to be found, I think, between knowledge and emotions. It is precisely the understanding of certain details that produces emotions* (F.B., regular visitor). The online visit appears to be globally less pleasurable. Sensory stimulation and aesthetic pleasure are diminished by the lack of realism in the videos. Passivity is induced by the sitting position when viewing a Web site. *It's not as good as being in a museum. It doesn't necessarily give you a fair idea [of the artwork]. It produces less emotion – you're more passive* (M.-J.T., regular visitor).

Rhetorical dimension

While learning and understanding may not necessarily be the primary motives for a physical visit (Marteaux, Mencarelli and Pulh, 2009), what of the physical visit with mediation devices?

Audio guides apparently contribute rather weakly to producing meaning for the individual confronted with the artwork. They can enable one to contemplate the work and receive information at the same time (cognitive dimension), but the content is judged as poor and incomplete: *There's the selection of works to start with... Because there's no hand to point things out, it doesn't add a great deal* (F.B., regular visitor). The interactive terminal is *a good intermediary between the audio guide and a tablet* (F.B., regular visitor) because one can target information while moving rapidly over what is of less interest. But even if the contents of the terminal can be quite rich when it is connected to the Internet, the information remains too general. This shortcoming can be addressed by augmented reality, *which is more practical for comparing the work and information* on the same screen or by multi-user touch-screen tablets that allow one *to see in more detail, to see things more closely* (F.B., regular visitor) and *to discover works differently, unlike a guide, which has you discovering works in a more off-putting way* (G.C., regular visitor). Moreover, audio guides and terminals require varying levels of concentration: *It's easier to concentrate on terminals because they are quick to use, whereas when I look at a painting with the audio guide I tend to think more and so I stop listening* (L.P., regular visitor). The outcome is that the information that might help the visitor to give meaning to what he or she sees is not properly memorized, a situation that is reinforced by the physical distance between the terminals and the artworks they are there to enhance. While access to the Internet *in situ* can provide more information directly, this medium does not always make it easier to find meaning. The ergonomic quality of the site, then, may be a deciding factor. *Sometimes the information is diluted across the Web sites of all the organizations that might have hosted an artist, so that implies a substantial job to find it* (V.C., regular visitor). One respondent concluded: *Internet, SmartPhones, tablets – that will necessarily be information I will target, information that I want to find, so it will stay within my field of perception, whereas normally the guide or audio guide is there to extend my vision to things I did not see* (B.V., non-visitor).

Praxeological dimension

During the course of a physical visit without mediation devices, atmospheric factors reduce the feeling of tiredness (Bitgood, 2009), accentuated by the dimensions of the space, and reduce the sense of oppression if it is crowded (Dion-Le Mee, 1998). Atmospheric factors can also promote aesthetic pleasure, well-being and visitor immersion. However, the impact of the physical environment on the experience may, under certain circumstances (poor heating, mobile phones ringing), be negative. Companions for the visit or crowds have the potential to promote or inhibit some types of emotion. While the social environment positively affects the experience (in terms of sharing moments of conviviality and mutual support) (Debenedetti, 2003), it may detract from the contemplative and aesthetic pleasure and the intimacy with an artwork. Besides, the preference for visiting alone or with companions is situational. The two ways of visiting generate different emotions.

Another finding is that auto guides can affect the viewing sequence of other visitors: *It's terrible for the other visitors, because when you have the audio guide there are three or four people who are stuck in front of the painting and don't move, and people can't see!* (F.B., regular visitor). Having to wait because of crowds is also a problem for users of interactive terminals, which are criticized as being too few in number and poorly located: *I don't like the terminals at all! First, there are too few of them. Then, often they are at the entrance and afterwards you go off and forget about them.*

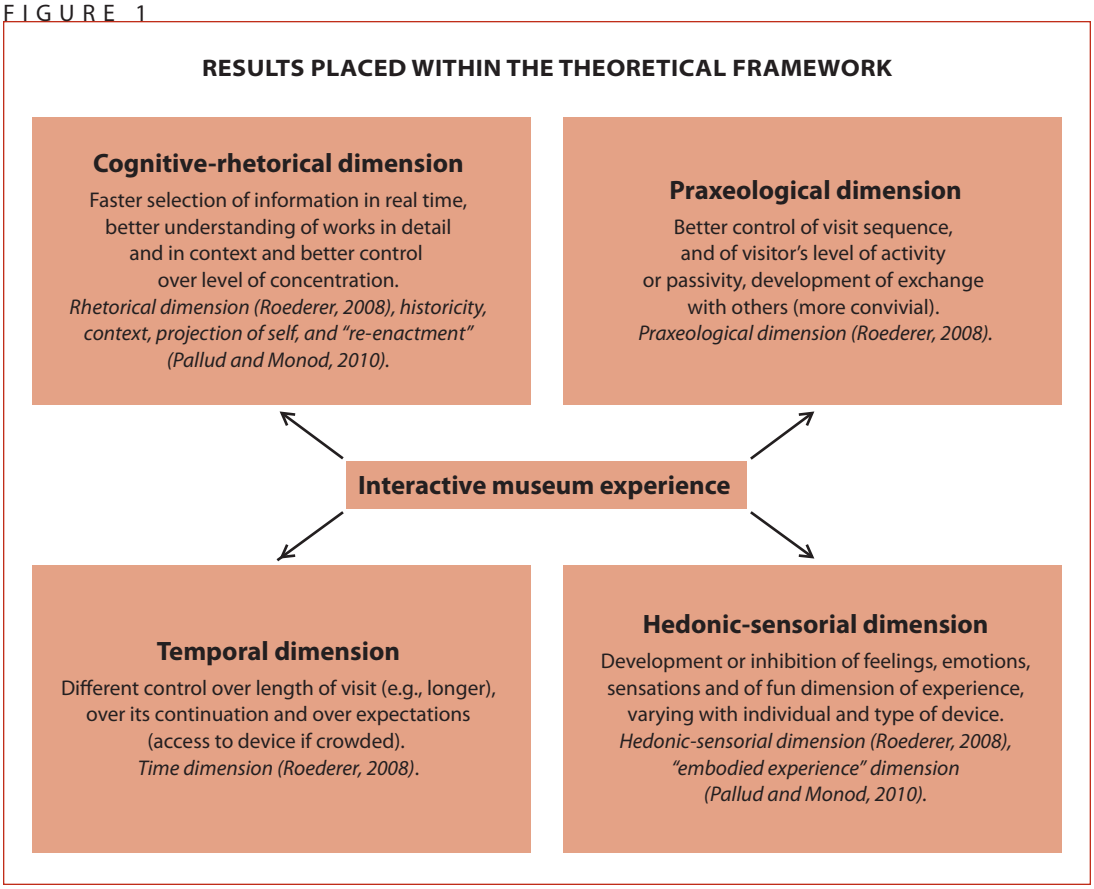
If you could take them along – if they were on castors – it would be feasible. I don't use them...people spend too long on them (G.C., regular visitor). Audio guides complicate or even prohibit exchanges: *The audio guide shuts you in,...if everyone takes an audio guide, I don't see any point in going to the museum!* (G.C., regular visitor). SmartPhones and tablets contribute more ambivalently to the praxeological component of the visit. They promote access to artworks through rich and fluid navigation (via an application or a museum Web site): *There is geolocalization. You can imagine the artwork in 3D, actually see the situation live, click on rooms, see artists* (G.C., regular visitor). However, they can deter communication among companions: *With touch screens... you speak less with others* (L.P., regular visitor). This criticism applies less in the case of tablets, where it is still possible to *read in twos, at least, to see the info in twos and to look at things in twos* (G.C., regular visitor). Multi-user touch-screen tablets offset this lack of social interaction, provided there is no anxiety caused by crowds – *there are several people around it, so for me it's less comfortable* (B.V., non-visitor) – or stress due to having to handle the device alone – *alone, I don't think to use it because I'm not sure I'd know where to look* (L.P., regular visitor). The presence of companions or other visitors affects the use of interactive devices. This also applies in the case of online visits. One mother said that when she visited a museum Web site alone she consulted the practical information first, but when she visited with her child she went deeper into the illustrated sections of the site so as to share a moment of "waking dream" (Simon, 2007).

Temporal dimension

The perception of time during a museum visit without interactive devices varied widely from one respondent to another. While some admitted that *my head is bursting* (M.L., occasional visitor) after a while and looked for resting places, others lost all sense of time: *I really did spend four hours without looking at my watch!* (J.A., regular visitor). The immersion that some visitors experience may be so strong that all physical or psychological perception of the length of the visit is erased: *Strangely enough, I wasn't hungry! I forgot about everything!* (J.A., regular visitor). This is consistent with the definition of the state of immersion as "(a) cognitive and emotional concentration on the theme of the visit through one or more manifestations (thoughts and/or emotions are closely related to the experiences); and (b) the consumer's sensory system is stimulated exclusively by the environment relating to the experience" (Fornerino, Helme-Guizon and Gotteland, 2005, p. 48). At this exploratory stage, we can only assume, like Charfi and Volle (2010), that a moderating role is played by variables such as the place (reputation of the institution), the time of the visit, and the involvement and expertise of individuals with regard to museums.

Does the duration of the visit vary with the use of mediation devices? Do individuals manage the length of their visit in the same way with and without these devices? Opinions among respondents differ. Some believed that the museum makes more information available to them through such devices, so visits can only be longer: *I spend more time because, being inquisitive, I go and look for stuff and take the time to read, whereas if I'm in a museum without...devices to go and look for stuff, it's the minimum length* (B.V., non-visitor). Others thought that devices affect not so much the time spent but how it is used: *You can choose short summaries to go faster to what matters and scan all the works quickly. It doesn't necessarily take any longer because, sure, you're faster, more efficient, but perhaps you scan the work more* (G.C., regular visitor). When the Internet is consulted *in situ* (via the museum's mobile site or a search engine), it provides *tremendous possibilities for going and looking for information in real time, straight away in front of the work* (B.V., non-visitor); it is a precious time-saver that can substitute for other strategies developed by the visitor – for example, F.B. (regular visitor) would photograph the work and later do research online at home. The same visitor acknowledged the advantage of a tablet connected to the Internet: *With an iPad you can get information about what you're looking at straight away.* Overall, with the Internet, individuals seem to be able to exercise greater control over time spent. For example, they can add the site to their Favourites so as to continue the activity later on. Online booking is also a valuable time-saver. Physical components like ergonomics, design, and the aesthetics of the Web site determine the length of consultations. Respondents admitted that they did not always set a precise time, and may even lose track of time, except in a poor physical environment. Consequently, when one is using a mediation device in a fine art museum, time is more "a resource to be controlled" (Roederer, 2008) than an interval to be filled.

FIGURE 1



Recollection of the Experience and Behavioural Intentions

Many people wish to keep a tangible trace of the experience of visiting a fine art museum so as to remember it better and thereby extend the aesthetic or intellectual pleasure or a shared experience between parents and children.

Recollection of the experience

Collecting tangible traces relies more on print than on the Internet. *You buy the catalogue or postcards, but you don't say you've got photos on the Internet and print them out* (M.J., non-visitor). Nonetheless, the Internet is valuable for its complementarity with souvenirs collected *in situ*. *With the Internet, you can find what happened – it fills out what you saw, the photos you took* (M.J., non-visitor). For some respondents, their recollection of the experience relied less on interactive devices than on social interaction: *These devices [Internet, SmartPhones, tablets] will never replace a good guide. What I remember is someone who tells me something – it's not something I read but an emotion, time spent with people and not with machines* (B.V., non-visitor).

Behavioural intentions

For some respondents, mediation devices clearly contributed to their intention to visit a fine art museum. The Internet (mobile Web site), newsletters, RSS feed) and social networks (Facebook and Twitter) mean that visitors *can keep up with the news,...have a sort of Post-it note, a reminder of events* (G.C., regular visitor). Facebook was judged more effective in this role than Twitter, *where there aren't many museums yet and it's not as rich anyway* (G.C., regular visitor). However, these observations concerned only the impact of the Internet on the intention to visit fine art museums. For other mediation devices, the respondents expressed a different opinion. Such devices may *contribute to bringing a new generation [and] fans of that stuff [new technologies] to museums* (B.V., non-visitor) and *they'll meet up there because they had that experience and found it really enriching and will say it's really great to visit museums like that, or, "Hey, there are iPads in such and such a museum – I'm definitely going"* (G.C., regular visitor). Yet this respondent contradicted himself: *I don't think people go to a museum because there are iPads available* (G.C., regular visitor). But generally, older or less technophile visitors will go mainly for the exhibition itself. While mediation

devices make people want to visit museums, they do not encourage loyalty to any one museum but may attract visitors to another museum with mediation devices (individuals seeking variety). One respondent tried to conciliate these viewpoints by saying that mediation devices were *stepping stones* (L.P., regular visitor) for the younger generation, guiding them towards more traditional forms of museumgoing. The objective in having young people use these devices was to make the experience *much more accessible* and *not to bore them, because sometimes it's quite long and not lively enough* (L.P., regular visitor).

Discussion

Theoretically, our results make a contribution in terms of visits to fine art museums with or without interactive devices and the impact of the experience on visitors' behavioural intentions.

First, our work converges with that on the identification of sources of value that visitors attach to museumgoing in general: visits to museums and monuments (Bourgeon et al., 2005) and immersive museography (Collin-Lachaud and Passebois, 2006, 2008). The term "immersive museography" refers to a set of scenographic features – not necessarily multimedia or digital devices but features that reflect the theme of the exhibition and that are liable to immerse the visitor in the experience.

However, these two areas of research do not directly relate to the sources of value in conjunction with mediation devices, which are being made available in museums generally to attract young visitors or people with disabilities.

The main contribution of our findings is to underscore two forms of complementarity. The first is the complementary between devices that are directed at learning and feature limited interactivity (audio guides, terminals) and those that offer a more interactive, entertaining or multisensorial experience (augmented reality, etc.) while also addressing the cognitive dimension of the visit. The second form of complementary is that between those devices that restrict social interaction (audio guides, terminals or SmartPhones) and those that promote social interaction (large multi-user interactive tablets and touch-screen tablets). If one compares the Internet with interactive devices, one can observe a complementarity between the elements included on the Web site before the visit (plan, the museum's theme, etc.) and after the visit (photos of artworks, archives, etc.) and the information contained in the different interactive devices. The boundaries between an online visit and a physical visit fade when the visitor uses a SmartPhone or tablet. Individuals do not confine themselves to the information in the application, but also use the Internet (search engines, social networks) as a means of instant information searching.

In terms of management, we have a few recommendations to make. In the context of the physical visit, wayfinding and instructions for visitors about how mediation devices work could be improved. Staff intervention might also facilitate interaction between visitors and devices. Considering how each mediation device contributes to each dimension of the museum experience, our findings suggest that there are ways to make them more complementary and to make that complementarity more perceptible to visitors. We hope the findings will enable museums to better handle the presence of various types of devices at exhibitions, so as not to induce museum fatigue (Bitgood, 2009) or hyperstimulation. For example, including multi-user mediation devices might combat the adverse effects of the use of such devices on social connections. In our future research we hope to be able to construct profiles of users and non-users and identify their expectations in terms of the content of the devices used both during their visit (audio guides, interactive terminals, multi-user touch-screen tablets, etc.) and after (continuation of the visit via museum applications available on SmartPhones or tablets and via the Web site). The customized "fun" dimension of the museum visit is one of the main reasons for some users of these devices to visit a museum. Projects at the Musée des Arts et Métiers in Paris (PLUG1) and the Musée des Confluences in Lyon (PLUG2, led by Muséolab-Erasme) use games and quizzes to continue the fun (for more on these two projects, see Jutant, Guyot and Gentès [2009]). "Serious gaming" is invading the educational domain and is one possible way to enhance the content of existing devices. The trend towards "edutainment" should not, however, override the forms of traditional mediation that are essential and for which, according to some of our respondents, there is no substitute. By identifying profiles that are resistant to interactive devices, we might be able to suggest ways of adapting traditional forms of mediation. Lastly, at this exploratory stage we can only observe the ambivalent role of

mediation devices in generating the intention to visit and recommend museums. The results suggest that these devices are seen more as an aid to primosocialization in the context of fine art museums and concern mainly young, new or technophile visitors.

Conclusion

Our study has some limitations. First, it was purely exploratory. Next, the interviews were conducted using a convenience sample, which implies that certain categories are over-represented (regular museumgoers, young visitors, women, local residents) and others underrepresented (foreign tourists, non-visitors). Lastly, as with any method of collecting declaratory data, we cannot rule out the risk of social desirability.

Although the statements show that the museum experience is modified by the use of mediation devices, enhancement (or distraction, as the case may be) is not always sought when visiting a fine art museum. Our findings indicate that certain devices are acceptable in different contexts: audio guides for heritage sites, devices that include virtual elements or simulations for science or history museums. This observation suggests avenues for future research. In theoretical terms, we can assume that the type of museum plays a moderating role in the impact of mediation devices compared with the actual museum experience. Consequently, for some visitors these devices seem to favourably influence the dimensions of the experience (hedonic-sensory, rhetorical, praxeological and temporal). These visitors have a sensory and aesthetic experience when the devices make a museum less boring and less oriented towards the past. Other devices may prompt resistance to the aesthetic enjoyment of an artwork because the interactive museography puts the visitor at a distance from it. Our question therefore is whether the use of mediation devices should be promoted in fine art museums specifically. In terms of method, we plan to continue this line of research by developing frameworks for identifying the characteristics of users and non-users of a range of interactive devices. These characteristics will take into account, among other things, respondents' sociodemographic data, level of interest in new technologies and level of expertise (regular, occasional or non-visitor).

It would be appropriate to include the social and technological component of interactivity and its influence on the museum visit (physical and/or virtual) and the value ascribed to it. It might also be possible to extend the scope of this research to the impact of other online museum features (especially social networks and video games) on the experience and the perceived value.

Lastly, although the comments collected do not make it possible, at this exploratory stage, to determine the contribution of mediation devices to behavioural intentions about visiting a museum (intention to return to a fine art museum), they do underscore the relevance of the research question. Thus it might be useful to turn to the neurosciences to supplement the oral data.

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