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Amélie Clauzel, Caroline Riché, Bénédicte Le Hegarat, Romain Zerbib. Co-presence and mobile apps: Technology's impact on being with others. *Canadian Journal of Administrative Sciences - Revue Canadienne des Sciences de l'Administration*, 2019, 37 (1), pp.30-44. 10.1002/cjas.1553 . hal-03675934

**HAL Id: hal-03675934**

**<https://paris1.hal.science/hal-03675934v1>**

Submitted on 23 May 2022

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# Co-presence and mobile apps: Technology's impact on being with others

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## ***Abstract***

*Despite a lack of theoretical understanding regarding how consumers react when using mobile applications in a store, the latter are being used more and more often in shared consumption areas. This research explores the impact that using a mobile application has on perceptions of co-presence. Depending on the consumption experience stage, this technological tool can be a social facilitator that enhances interactions with companions or a device that makes it possible to reduce a negative crowd impression. This paper is positioned at the intersection of interpersonal influence research and research focused on mobile technologies' effect on the purchasing process. It may interest managers of sites where there is high co-presence and where a mobile application might reduce negative crowd impressions and facilitate in-group sharing.*

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**Keywords:** consumers, mobile applications, fellow customers, companions, service experience, museum

### ***Résumé***

*L'utilisation des applications mobiles par les consommateurs en magasin est, depuis peu, étudiée dans la littérature en marketing. Les travaux relatifs à leur usage croissant au sein de lieux partagés de consommation restent, eux, encore rares. Cette recherche s'intéresse aux effets de l'utilisation d'une application mobile au sein de musées sur les perceptions des consommateurs, notamment liées aux autres individus présents. Selon l'étape de l'expérience de consommation, cet outil technologique peut refléter un facilitateur social qui nourrit les interactions avec les compagnons et, dans le même temps, un dispositif permettant de réduire l'impression de foule. Cet article se positionne au confluent des recherches sur les influences interpersonnelles et des travaux dédiés à l'usage des technologies mobiles au cours du processus d'achat. Il peut intéresser les managers d'établissements dont l'offre implique une co-présence. Utiliser une application mobile adaptée pourrait alors réduire les impressions de foule et faciliter le partage en groupe.*

**Mots-clés :** consommateurs ; applications mobiles ; coclients ; compagnons ; expérience de service ; musée.

### **Introduction**

“Welcome to the smart phygital era”: combining the terms “physical” and “digital,” this slogan, featured on the cover of the 2018 Paris Retail Week Report (BayBridgeDigital, 2018), hints at the issues currently facing managers whose goal is to reach consumers through a variety

(digital, in-store) of communication channels. This omnicanality exemplifies the concept of phygitalization: digitizing the in-store experience with the goal of returning the consumer to the physical store (Feenstra & Glérant-Glickson, 2017; Moravcikova & Kliestikova, 2017). Digital technology can offer the consumer an interactive experience by employing both digital (availability of tablets, forums, augmented reality, and so on) and more social services (Pantano & Gandini, 2017). This trend has quickly affected service companies and often involves having the consumer(s) on site. Indeed, many service providers (such as museums, restaurants, concerts, and amusement parks) usually offer on-site consumption. In such cases, in addition to the consumer being present, the physical co-presence of other consumers is essential.

In this context, we can reflect on the role of new (especially mobile) technologies. Médiamétrie (2018) reports that 90% of time spent on the mobile Internet is spent using applications (p. 1). Therefore, developing mobile applications is a powerful lever that organizations can use to change behaviours (Kim, Wang, & Malthouse, 2015) and increase consumption intention (Bues, Steiner, Stafflage, & Krafft, 2017). Studies of digital use in a cultural context have offered models of usage intention related to technologies in general (see for instance Venkatesh & Bala, 2008; Bues et al., 2017). However, the effects of using a mobile application during the consumption stage alone or in a group have not received much attention to date. The social dimension of a consumption experience has been explored in several works that identify the actors and mechanisms of social influence. Social impact theory has long noted that people are influenced by the mere presence of another person or a group of persons (Latané, 1981). Since then, a wave of research has focused on characterizing social interactions with the notion of co-presence. This work is in line with the other customer perception (OCP) framework (see for instance Brocato, Voorhees, & Baker, 2012; Wu, Mattila, & Han, 2014), which aims to study fellow customers and their impact on consumption.

Fellow customers present at the same time as the individual consumer are divided into two subgroups: intentional fellow customers or companions (Debenedetti, 2003; Borges, Chebat, & Babin, 2010; Chebat, Haj-Salem, Oliveira, 2014), and imposed fellow customers, who are a priori unknown to the individual (Clauzel & Riché, 2015; Colm, Ordanini, & Parasuraman, 2017). The influence of these actors has received a great deal of attention in the service context literature. The consumer is an increasingly connected social being; to meet this need for connection, brands respond with an offer combining physical and digital channels, such as mobile applications. The motivations for using mobile applications often mirror those of the physical experience: entertainment, function/information, socialization, intellectual stimulation and learning, geolocation, and temporality (Ho & Syu, 2010). However, little research has examined the effects of using mobile technologies within a service establishment where many individuals are present, regardless of whether they know each other or not. The question that arises is whether co-presence is perceived in the same way during a consumption experience if the customer is using a technological intermediation tool.

There is a lack of theoretical knowledge about the effect of mobile technology on co-presence. Therefore, the objective is to qualify how the consumer's perceptions of others can be modified by using a technological mediating tool on site. The present study is positioned among other works related to co-presence—specifically, those in the other customer perception (OCP) field—during a consumption experience, and those that examine the use of digital and mobile technologies in an interpersonal context. We question the social dimension of an instance of consumption when a mobile tool is being used. Despite numerous potential implications, this has rarely been the focus of study in previous works. The purpose of our study is to identify to what extent the use of new mobile technologies during consumption could modify an individual's perception of the other individuals who are present.

To this end, our work is based on a qualitative methodology aimed at studying the effects of using a mobile application on the way co-presence is perceived in a consumer context requiring co-presence on site, in this case, a museum visit. From a theoretical perspective, this article contributes to thinking on the role of in-situ co-presence in the context of technology use during a consumption episode. Managerial issues relate to different aspects, such as regulating crowds, managing different types of groups simultaneously engaged in consumption inside an establishment, and managing different groups of consumers who do not know each other.

## **Theoretical Background**

### **Fellow Customers: Impact of Other Participants During a Consumption Experience**

Although front-line employees play an essential role in consumer behaviour (Rippé, Weisfeld-Spolter, Yurova, Dubinsky, & Hale, 2017), fellow customers also condition an individual's experience (see for instance Colm et al., 2017), sometimes to a greater extent than the offering itself. This notion of co-presence reflects the level of presence of other individuals in the same place, where an individual can perceive the behaviour and emotions of the other participants who are present (see for instance Campos-Castillo & Hitlin, 2013). According to Zhao (2003), co-presence can be, in an interdependent way, not only objective (physically being with others), but also subjective or even emotional (feeling of sharing with others). These authors distinguish between the concepts of co-location (the spatial aspect of co-presence: people physically located at a certain distance from each other), and social co-presence (enabling people to have contact, to interact) (Zhao & Elesh, 2008). In this regard, two main fields of research can be defined: one dedicated to other known co-customers or companions—those who deliberately accompany the consumer during the experiential process (that is, chosen fellow customers)—and the other included in the OCP field and focused on studying present but unchosen or unknown fellow customers.

### **The Role of Companions During Consumption**

In a consumption process, companions reflect the more or less visible presence of one or more people close to an individual (couple, friends, family, or children) during the consumption experience (before, during, or after).

In a purchasing context, studies focus on the overall effects that the entourage's presence have on the individual's experience—for example, higher expenditure (Hart & Dale, 2014) as a result of a reduction in the perceived risk of the purchasing decision (Kiecker & Hartman, 1994). In general, shopping with someone improves the global shopping experience, as has been demonstrated in a Canadian context (Borges et al., 2010). The positive effects that companions have on satisfaction have also been highlighted in different contexts, such as food services and the retail sector (Hart & Dale, 2014). In the museum context, the learning process would be more beneficial when the visitor is alone because the individual then appreciates the opportunity to reflect without being distracted. At the same time, however, sharing a visit as a group also provides an opportunity to enrich and discuss ideas with others (Packer & Ballantyne, 2005).

Global satisfaction impacted in this way would be generated by an increase in positive emotions linked to the presence of others, which would represent a real stimulus for the consumer (Chebat et al., 2014). In the same vein, Lucia-Palacios, Pérez-López, and Polo-Redondo (2018) note a decrease in negative emotions because of the presence of companions, particularly the stress felt, which decreases when people are not alone. In this context, the companion's role is to perform, consciously or unconsciously, many tasks traditionally performed by the seller, which leads to a better experience (Lindsey-Mullikin & Munger, 2011). More recently, Jeong, Crompton and Hyun (2019) demonstrate that consumers who shop alone are more sensitive to prices. It also appears that, in such cases, the customer is more attentive to unknown (that is, anonymous) fellow customers than when shopping with a member of their inner circle (Borges et al., 2010).

While these studies mainly emphasize the overall effects of the presence or absence of companions during the experience, only a few studies have examined the role of known fellow customers according to their role and to the ties between them and the individual (friends,



family). In this respect, Borges et al. (2010) show positive effects of “known co-presence” that are moderated by the purchasing companions’ identity and status, as well as by the level of familiarity and their experience with the brand. When customers do not identify well with the purchasing environment (poor knowledge or little experience), the presence of others improves their experience. By contrast, these customers would prefer to be alone when they know the environment well (that is, they experience greater pleasure when alone than with a family member). Depending on the cultural context, the results do not always fully converge. While Borges et al. (2010) conducted their study in Canada, recent work in an Australian context shows that, on its own, being with family increases positive emotions and improves brand evaluation (Merrilees & Miller, 2019). With regard to friends, Canadian studies have noted that shopping with friends has a positive influence on shopping centre traffic (Borges et al., 2010; Chebat et al., 2014).

In the context of service consumption (leisure, in particular), collective participation offers opportunities to develop new social skills thanks to the creation of a space in which the social bonds between friends or within the family are strengthened (Kelly, 1983). In this context (as in the museum, for example), Debenedetti (2003) notes that sharing the experience as a couple leads to a less structured visit and strong interpersonal proximity. He also points out that the presence of young companions (children) strongly influences a visitor’s museum experience (greater physical proximity, less time spent, more structured itinerary, stop at the shop).

### **Perceptions of Unknown Fellow Customers During Consumption**

Fellow customers are the other people present in the same place and a priori unknown by an individual customer. The co-presence of unknown customers and the social interactions it produces are a situational variable that is partly characteristic of the consumer context. Other

customers have long been studied with regard to their influential role as help seekers or help providers with more or less obvious influences: overt or face to face versus covert or oblivious co-presence (McGrath & Otnes, 1995).

Recent works have proposed typologies of influence of other unknown customers, such as “customer co-presence influence modes (CCIMs)” (Colm et al., 2017), a term that classifies the different influences of others according to the type of interactions (reactive/proactive and social/instrumental), the way others are observed (searching and comparing information) and the spillovers on the individual (spatial and/or behavioural). Several effects of the presence of unknown people in a purchasing or service consumption context have been demonstrated. While the literature seems to show mostly negative effects, more recent studies have produced more nuanced results and even note some positive effects of this type of co-presence depending on the situation, certain moderating variables, and the empirical context (restaurant, hair salon, theme park versus store, queue).

In the field of services, co-presence has effects on perceived quality, emotions and satisfaction. Its effects on service quality rating have been shown to be strong and mostly negative (Chebat, Filiatrault, Gelinas-Chebat, & Vaninsky, 1995). To assess these effects, customers mainly rely on social density, depending on the service context (such as the type of restaurant), human density (number of people present), and built density (number of tables, chairs in the restaurant and proximity to each other; ambient conditions, symbols, and spatial layout) (Hanks, Line, & Kim, 2017). The consequences on satisfaction are also negative: satisfaction is lower when the level of co-presence is high (see for instance Grove & Fisk, 1997; Wu, 2007; Papathanassis, 2012). These results can be explained by a negative perception of the crowd (called “crowd impression”) and the negative emotions that arise (Argo, Dahl, & Manchanda, 2005). Queues (boarding a plane, waiting in a crowded buffet line) produce discomfort and

sometimes cause interpersonal conflicts (see for instance Grove & Fisk, 1997). In the same vein, Wu, Mattila, and Han (2014) point out that a combination of three factors increases the feeling of negative emotions while decreasing satisfaction: the relationship to space (a restaurant), the perceived similarity with others, and the level of crowding. For this reason, this latest study recommends that moderators temper these results. According to Brocato et al. (2012), who propose an OCP scale, three dimensions can be considered: perceived similarity (Wu et al., 2014 have already mentioned the role of this dimension on satisfaction, a finding confirmed by Afthinos, Theodorakis, and Howat [2018], in the context of aquatic centres), the level of perceived normality of behaviour—that is, whether appropriate or not, confirmed by Afthinos et al. [2018]), and perceived physical appearance. Yi, Gong, and Lee (2013) refer to credibility toward others, which, along with behavioural norms, affects the perception of co-presence.

Other moderators may temper these results. For example, individuals can be more severe in their assessment of service if other consumers (seem to) belong to a different age group or nationality (Grove & Fisk, 1997) or have a different marital status (Wu, 2007). This perceived homogeneity might allow travellers to better enjoy their holidays (Wu, 2007). Thus, the effects of unknown consumers' presence may be beneficial and have a positive influence on loyalty (Moore, Moore, & Capella, 2005), depending on the level of service offered (for example, in a hair salon where the level of service is high).

These studies focus on how people influence each other during a consumption experience, whether in an intra- or intergroup setting. Nevertheless, many potentially moderating variables need to be studied in order to analyze the phenomenon in a comprehensive way. In particular, the literature has not devoted much attention to how the introduction of new technologies, particularly mobile technologies that can be used on site (in a store, for example), can affect the

influences described above. A few rare and recent articles focus on the effects of using in-store mobile technologies in a socially shared space.

### **The Effects of Using Intermediation Tools During the Consumption Episode**

Retail and services are characterized by the increasing use of advanced and interactive technologies (mobile applications and virtual and augmented reality) based on high connectivity—ubiquitous and contactless systems that improve and support the consumer experience.

In the context of everyday purchases, the literature shows that new technologies are accepted all the more readily because they allow people to be more autonomous and to save time (Bonnemaizon, Cadenat, Benoit-Moreau, & Renaudin, 2012) by providing the most relevant and/or personalized information (Kallweit, Spreer, & Toporowski, 2014). By using applications on site, it is possible to reduce contact with the salespeople. Feenstra and Glérant-Glickson (2017) note that self-service information technologies (SSIT) can enhance customer experience in different ways—in social, sensory, recreational, and aesthetic aspects.

More specifically, the use of smartphones in stores is much less studied than mobile shopping (Bezes, 2018), and the benefits of mobile in stores are often still utilitarian (Fuentes, Bäckström, & Svingstedt, 2017). However, from a managerial standpoint, retailers and service providers are seeking to reinvent their point-of-sale by phygitalizing them: mixing physical and digital tools in order to multiply information and sensoriality. It should be noted that, at present, research is mainly concerned with the use of new technologies before the consumption episode or at the very beginning of the experience (that is, during the information research stage, as in the case of holiday planning, see Xiang, Magnini, & Fesenmaieret, 2015), but there is little focus on the use of mobile applications during the consumption episode.

However, Pantano and Gandini (2017) point out that technology-enriched stores help develop new forms of sociability between individuals. Indeed, some advanced features emerge from the study of smartphone use in store: mainly utilitarian, hedonistic, and social functions associated with risks (financial and privacy-related). These authors note the importance of studying the different facets of an experience with regard to the functions provided by using a mobile phone in a store. But while the two main mobile behaviours in stores have related to seeking information and engaging in purchasing transactions, the experience with mobile tools is changing fast. For example, Laukkanen (2016) implies that the adoption of mobile services could be influenced by an image projected on the consumers' group (social image). Besides these works, the literature has not yet studied the role of these technologies on the central social dimension of a consumption episode. We study the impact that using an in-store mobile application has on the consumer experience's social dimension.

## **Methodology**

### **Justification of the Research Field**

As they strive to fulfill their mission of conserving, preserving, and sharing knowledge, museums are faced with ever-shrinking budgets and ever-increasing competition. Thus, they are trying to establish original forms of exchange with visitors. Mobile technologies and interactive devices could be used to strengthen traditional communication tools between visitors (see for instance De Blas, Bourgeon-Renault, & Jarrier, 2015) and in so doing attract current and potential visitors more effectively. Such organizations offer a wide array of consumer experiences that include a core service (exposure), peripheral services (restaurants, restrooms, shops, and so on) and, increasingly, different mediation tools (see De Blas et al., 2015). The museum consumption

experience is also defined, as are other areas where people consume on the site (such as theme parks or restaurants), by the presence of many consumers, including companions or chosen fellow customers, as well as those who do not know each other (unchosen fellow customers). This makes it a preferred field to study the phenomenon of co-presence and the effects that can be generated by using new technologies at the consumption location. While there has been some research into co-presence phenomena at theme parks and even restaurants (Colm et al., 2017), the museum field has rarely been studied with regard to this co-presence issue.

## **Procedure**

To understand the impact that using mobile technologies has on perceptions of co-presence, we rely on a qualitative consumer study based on semi-structured interviews. As suggested by Oppermann (2000) and Flick (2018), in order to interpret and understand consumer rhetoric in depth, a multiple and complementary analysis of the data ensures the convergence of the results. The authors point out the importance of multiplying data analysis techniques when mobilizing qualitative methodologies to study a phenomenon in a comprehensive way. As suggested, in order to explore the subject further with respondents, we chose to observe, in the last part of the interview, how the respondents handle the application and what they spontaneously perceive during this time of use. This technique makes it possible to get closer to the real conditions of using the application. In the same vein, data analysis is based on triangulating analytical methods to dissect the respondents' discourse. Thus, as suggested by Kahn, Tobin, Massey, and Anderson (2007) and by Humphreys and Wang (2017), we complete the manual content analysis with a computerized textual analysis using LIWC software, which, as detailed below, is particularly suitable for measuring a speech's emotional, cognitive, and social dimensions (Kahn et al., 2007).

## **Type of Mobile Application**

This research explores the way in which using mobile applications during a museum experience influences relations with others and perceptions of co-presence. Museum applications fall into three categories: institutional (the museum and its positioning), reference (simple presentation, such as a visual directory) and showcase (equivalent to the mobile version of the website). Three forms of content are currently on offer: material to complement the visit (interactive tours, virtual visits, and mini-games), visitor guides (audio guides, videos), and practical information (plans, schedules, news). Our study is based on the most complete mobile applications mobilizing all three forms simultaneously.

## **Sample**

To understand the perception of co-presence, we interviewed 27 consumers via semi-structured interviews (the average duration of these interviews was 135 minutes). The sample consisted of mobile-dependent and less mobile-dependent individuals selected to ensure profile diversity in terms of demographic characteristics and the use of mobile technologies (Table 1).

[Insert Table 1]

The interview guide focuses on the effects on the individual using the application around the time of the visit and how the visitor uses the application during, before, and/or after the visit. The remainder of the questions essentially focus on the effects of this use by social context (companions: *With whom? How was the application used?*; alone: *Was there a crowd? How was the application used?*). In order to be as close as possible to the actual conditions of use and to

gain a deeper understanding of their perceptions when they are using an application, we also asked the respondents to run a museum application (either already downloaded or downloaded on the spot by the respondents) during the interview. In line with Flick's (2018) recommendations, the complementarity of appropriate qualitative techniques allowed us to observe respondents' reactions in different ways and to identify what might hinder or motivate them when they visit a museum. Apart from collecting respondents' perceptions, we were able to observe verbal and non-verbal, physical and interpersonal reactions related to their use of the application.

## **Data Analysis**

The textual data interpretation is based on two complementary types of content analysis.

Firstly, we rely on software content analysis using an algorithm proposed by psychologists (Linguistic Inquiry and Word Count – LIWC), which helps identify a text's linguistic structure around certain dimensions: social, cognitive, emotional, perceptual, and linguistic (Boyd & Pennebaker, 2015; Pennebaker, Boyd, Jordan & Blackburn, 2015). Inspired by linguistic theory and methods, the marketing literature has recently highlighted the relevance of automated text analysis (Humphreys & Wang, 2017). In particular, the authors note that LIWC is very useful when examining text content that neither researchers nor consumers can detect without additional support. The categorization of the discourse into 92 dimensions is appropriate and relevant to dissect respondent narratives. This type of analysis is particularly useful to verify the extent to and the way in which interpersonal dimensions are mentioned (see for instance Kahn et al., 2007). The LIWC procedure is based on a word count and coding assigned to a particular category. Then calculations are made for each interview (proportion in percent of the words contained in each interview and assigned to each category). To analyze these results, we use the



mean (and possible mean difference) of the scores obtained according to different variables: age, sex, number of children, and frequency of using a mobile application (see Table 2).

This analysis of the corpus allows us to assess the social dimensions, which we can then understand in a more thorough way thanks to a manual content analysis (both vertical and horizontal) performed by two coders with a high level of agreement. These two complementary analyses highlighted different facets of the social dimensions that influence respondents from different perspectives.

[Insert Table 2]

## **Results**

### **Perceptions of Co-presence when Using Mobile Applications**

The use of museum mobile applications is characterized by two phenomena. Firstly, the application acts as an accelerator of social interactions when the experience is shared with fellow visitors. Conversely, it seems to create a bubble of intimacy with respect to the out-group, namely the set of unknown participants, some of whom must be tolerated, which reflects the notion of an imposed fellow customer. Similarly, co-presence is not perceived in the same way by experienced users of mobile applications and those who use them less often. Respondents who use few applications are more likely to mention fellow customers and their association with more negative emotions. Users who are more familiar with applications evoke them less often and verbalize more positive emotions.

Moreover, the respondents' discourse can be interpreted in relation to the visitor's path, where each step bespeaks a social dimension more or less centred on the self. The way in which respondents use an application depends on a temporal dimension of the experience: the use of the

mobile application during the visit and its use outside the visit. The LIWC results show that the discourse related to fellow customers focuses (quite logically, and for 78% of the words) on the in-situ experience, that is, during the visit (Table 2). Thus, we observe a differentiation in the use of a mobile application according to both the type of co-presence and the stage of experience (during versus outside the experience). Our results are structured in this way, as Table 3 indicates. Table 3 also provides, throughout the results section, illustrative quotations from the respondents interviewed.

[Insert Table 3]

### **Using Mobile Applications Enhances Sharing Experiences with Companions**

**During the visit.** Respondents continually and spontaneously mention the notion of the social sharing of the experience with companions, particularly among the youngest (15 to 25 years old) and the oldest respondents (over 46 years old). The LIWC analysis shows that the proportion of terms related to companions is 12.6% higher for the youngest and 9.9% higher for the oldest respondents. As detailed in the following paragraph, the adults (26 to 45 years) evoke companions but rather focus their statements on fellow customers who are present. Because of their access to technologies since early childhood (and their implied familiarity with this tool), the idea that the young audience (under 25 years) may use mobile applications more frequently to develop social interactions is partially confirmed here, as the LIWC results show. It also appears that older respondents frequently mention visiting companions. Among these individuals (over 46 years), it is family in particular that is mentioned most often, even if this point is not linked to a significant change in positive or negative emotions. Overall, the discourse of the oldest cohort

is much less emotional than that of the other two age groups. The manual content analysis shows that, for these respondents, companions are a key factor behind making the visit (Table 3).

In addition, the notion of transmission of knowledge, particularly to children, is prominent throughout the narratives. As the LIWC analysis shows, having children leads to different perceptions of the presence of others. Individuals with one child are less likely to mention the social dimension (-19% of associated terms, with a discourse containing much less negative emotions, -23% of associated terms) than people who have either no children (and are more likely to evoke groups of friends) or more than two children. Table 3 provides quotations to illustrate these results.

Discourse concerning the visit itself (during) continually raises the notion of a bubble of intimacy that is sought out, from the standpoint of both the individual and the in-group. Other respondents discuss other known visitors:

*So, for example, three of us were visiting, and we were in sync. I went with my kids, and all of us wore the headphones, but I decided to play a comment. And with a click, they heard the same one as me. It was great! (Vincent, age 36)*

Although the younger co-participants (children) are often mentioned, the app also lets users share new knowledge and enrich their experience with adult co-participants with differing affinities, like friends or colleagues:

*I remember during my visit to the National Gallery, we did a treasure hunt at the museum, and you really had to look at the works closely. It's my colleagues from the Arts Faculty who prepared this little game by using the website about the works, the plan... And actually,*

*it's true that if you have the app at the time, it can be a plus because you're with your group, and the group is looking, etc. (Estelle, age 39)*

With groups of friends, a form of normative dimension is emphasized:

*I really like the game side of it, which confirms the acquisition of new knowledge after the fact! To see if I missed things [. . .] I also download, because everyone, my friends, say they have tonnes of apps, so why not? (Aude, age 35)*

**Outside the museum visit.** From the individual or in-group standpoint, the museum application offers visitors a new tool to accumulate knowledge without having to visit the museum itself. While opting for a passive visit, individuals can also focus on their centres of interest when using an application. Accordingly, respondents sometimes want to prolong the interaction with children after the visit, rather like an educational sharing tool (Table 3). It is also a way to continue the transmission of knowledge and to check whether everything was fully understood and remembered after the visit:

*I use museum applications after the visit to top up things done with my kids and to try to transmit knowledge without coming across as a moron. (Laura, age 34)*

### **Using Mobile Applications and Perception of Fellow Customers**

**During the visit.** During the visit, it is the adult group (26 to 45 years old) that most commonly discusses the interpersonal dimension (+8.7% of associated words in LIWC) alongside stronger negative emotions. They use much fewer words related to family or friends.

This suggests that the social dimensions and negative emotions felt are linked to other consumers, those who are not the visitor's companions. Thus, these fellow customers are imposed and unpleasantly experienced by individuals in this age group. The notion of a bubble of intimacy is constructed with the in-group in opposition to the out-group or unknown visitors:

*I prefer to escape quietly and spend a short or long time, as I wish, in each room and in front of each painting, with the application. It's almost all I do. Sometimes I turn my ear when there are groups and listen surreptitiously. Otherwise, I'll stay in my corner. If the application also replaces the audio guide, I'd have nothing against it. (Albéric, age 18)*

Favoured by the use of the application, this intimacy that individuals visiting alone or in groups expect is nonetheless associated with a fear of isolation because of the same bubble, as illustrated by the LIWC results for adults whose anxiety level increases by 24.4% above the average anxiety score. As Table 3 also shows, some respondents associate the frequent use of a mobile application with a risk of isolation during group visits. Increasing the number of information channels, including the application, also seems to heighten the fear of missing out on the physical and social experience:

*But there you go. The experience may also be cut off, you see. Look at the Mona Lisa: if I don't look at it, I don't look at it. It's like your kid's show. If you spend your time filming it, you only see it as a video; you don't see the show. (Vincent, age 36)*

Studying co-presence usually involves considering the triptych of customer, fellow customers, and frontline employees. In the respondents' statements, using the mobile application

seems to complete the role of contact employees, especially in cases of high co-presence (strong crowd impression). The mobile application is seen as a tool to improve and transform into a real interface of customer relationship management (here, the visitor relationship) as a complement to frontline employees (Table 3):

*Even if I have my doubts about the quality of technology today, you have to do it to get there one day, to exceed the level of a human in terms of personalization and freedom. The human guide in some way tells you what you have to do. Between the human guide and freedom, it's a solution. These are possibilities. (Vincent, age 36)*

**Outside the museum visit.** The LIWC results show that the focus-past dimension reflecting social attitudes formed prior to the visit makes up 16% of the total number of words dedicated to the social dimension.

A passive behaviour toward the cultural institution is often justified by crowd phenomena. Respondents mentioned their reluctance to visit a museum in a crowded place and claimed that the application compensates for this in a way that seems to satisfy them and even provides new motivation for them to visit the museum:

*At any rate, if I think there'll be too many people, I don't go. So it's better to have an application to know the museum anyway. Nevertheless, it's true that if the application gives me schedules and shows the visitor traffic, I could see. (Josiane, age 67)*

This dimension reflects the pre-visit and a social barrier to visiting the museum. In addition, the use of the mobile application when other consumers are present is sometimes also

mentioned after the visit. Thus, the application becomes an exchange platform on which a discussion of common interests or sharing of opinions about the visit with other visitors is welcomed (Table 3).

## **Discussion**

Our research shows that co-presence is not perceived in the same way during a consumption experience (here, in a museum) when people use a mobile application. The mobile application is evoked according to two quite distinct temporalities: during the museum visit and outside it. Two main actors of co-presence are differentiated: companions (children, couple, friends, and colleagues), and fellow customers. Frontline employees also appeared as a thread in respondents' statements.

Overall, companions were evoked with emphasis and many positive emotions before, during, and after the visit. The mobile application is a way to isolate one's group when necessary—a tool to enrich communication with others and a vector for knowledge transmission, especially among the youngest and oldest consumers. For those who are less inclined to use mobile applications, it poses a risk to the group dynamic (in particular, the risk of desocialization due to concentration on a technological tool).

Fellow customers are mentioned during the visit with much less emphasis and with more negative emotions. In this regard, respondents mainly mention that they use the application to protect themselves from the crowd. If a crowd is expected at the point of service, some consumers are even prepared to avoid a physical visit by opting for a virtual visit. The consumers who use the applications the least often perceive the situation differently: the application destroys the social ties or exchanges that could be created with other visitors.

Finally, the application acts as a utilitarian tool that could complement or even replace the role of the frontline employees, thereby preventing the need to wait for a response, for example. Ultimately, it may serve (when technically possible) as a platform to have exchanges with these fellow customers after the visit. Thus, perceived co-presence is modified with the use of an in-situ technological tool; this is reminiscent of the results of Kurtaliqui, Miltgen, and Pantin-Sohier (2018), who highlight socialization and desocialization effects in the context of using mobile technologies in-store.

As detailed in Table 4, these two main results can be interpreted via the opportunity provided by the use of an application on site, around three dimensions: to interact, to be inward-looking and to transmit knowledge.

Firstly, using mobile technologies on site suggests the opportunity to interact with others, especially with visiting companions, which generates positive emotions, but also with other unknown consumers, which generates negative emotions, in particular for non-users.

Secondly, the mobile application also provides a way to protect one another by falling back on oneself. However, such use can create a risk of isolation and the possibility of missing the experience or potentially not enjoying the presence of one's companions. In addition, the mobile application allows users to react to negative emotions due to crowd phenomena (reducing crowd impressions, creating a bubble of intimacy), depending on whether they are anticipated (before) or lived (during).

Finally, respondents mentioned the need for cultural and intergenerational transmission during an experience. These educational benefits of a mobile application are particularly appreciated by consumers, especially when a child is present, which generates a more self-centred and emotionally positive experience. In this sense, the presence of the mobile application allows a way to “phygitalize” the point of service by making it possible for the consumer to live a



complete experience by linking digital elements with physical paths. Regarding the presence of friends, the use of a mobile application is mentioned with less emphasis and more negative emotions.

[Insert Table 4]

### **Theoretical Contributions**

By emphasizing the relevance of social components and thereby expanding research on customer-to-customer interactions, our work is in line with that of Colm et al. (2017), who classify the influence modes of co-presence. In particular, we observe similarities in our study regarding how co-present individuals are perceived and how others' individual behaviours influence them in a particular space. Overall, this work contributes to the literature in different ways.

On the one hand, it provides an opportunity to pursue research focused on the role of emotions in shared consumption experiences in the same area, like Lucia-Palacios et al. (2018), who note a decrease in negative emotions through the presence of companions. In line with Chebat et al. (2014), we observe positive emotions linked to the presence of companions, which is, as shown here, a major driver for French consumers; a comparative study with other nationalities may also be a promising avenue for research. Following the studies by Borges et al. (2010), we highlight the positive effects of the presence of companions, reinforced here by the possibility of using mobile technology at the same time during the visit or together with these companions (and according to their status, of child, friends, or colleagues). These findings build on the work by Debenedetti (2003), which was conducted in the context of museum visits but without any focus on digital channels. Debenedetti observes that sharing a museum experience

with children is associated with significant physical proximity, less time spent, and a more structured itinerary. Indeed, using an application helps optimize and frame the time spent during a visit by tracing a structured path at the location. Our results underline that mobile applications could fulfill the same role as frontline employees. If the application seems to serve the same functions, this is a motivational factor for consumers who feel that they do not have to wait if any questions arise. These results echo the findings of Lindsey-Mullikin and Munger (2011), according to whom companions can perform certain tasks traditionally performed by the seller. We also note that the use of the mobile application allows companion groups to have a complete experience.

On the other hand, with regard to unknown fellow customers, our work relates to research showing the positive effects of others until such time as the consumer perceives and feels what is called the “crowd impression,” which is associated with much higher negative emotions, as already evoked by Wu et al. (2014) in a restaurant context. The use of a mobile application is not only utilitarian but also quite social, as Fuentes et al. (2017) assert, and there is a strong emotional component in the context of a museum consumption experience.

### **Managerial Contributions**

Our findings yield several managerial contributions. Service providers should pay particular attention to the use of mobile technology tools when consuming services that involve the presence of many customers. The use of mobile applications during the experience offers the consumer a certain level of flexibility (with regard to a co-presence that can be badly perceived) because the latter allows consumers to be more communicative with their own group while simultaneously isolating themselves from unknown fellow customers. Overall, the possibility of immersing oneself in the visit while learning through the application generates more positive

emotions, which suggests a better experience for consumers. It should be pointed out that consumers may blame the service provider for any adverse or harmful effects of their co-presence, in terms of both the quality and the effectiveness of services.

Our observation of the need to transmit knowledge is worth considering for both service managers and application developers. In particular, it is important to consider the presence or absence of children, as parents' need to transmit and enrich intergenerational interactions can be met by using the application. Mobile app developers can offer specific tabs offered to children and more recreational digital areas to service providers, which will be welcomed. Museums must rethink the tools and services integrated into their mobile applications, such as audio guides. Offering specifically targeted paths (family, children or solo visitors) can easily be considered from both technical and managerial standpoints. Mobile application developers should bear in mind that the possibility of interacting within the application is particularly important in the context of a museum visit.

### **Limitations and Avenues for Research**

This work has some limitations that could open new research avenues if addressed in future studies. Firstly, the methodological limitations concern the sample, as it is composed of respondents whose occupation is homogeneous (manager, senior manager, or student). Investigating individuals from other categories could improve the external validity of the results. Nonetheless, this variable did not appear to be discriminant here. Furthermore, respondents were free to choose the museum application to experiment with during the interviews. This might introduce a comparison bias between individuals during horizontal content analysis.

Moreover, the respondents were exclusively French. If this study provides a better understanding of French visitors (who have received little academic attention with regard to this

issue) and thereby adds to the studies conducted in Canada (see for instance Chebat et al., 2014) or Australia (Merrilees & Miller, 2019), it may be worth comparing these reactions for other nationalities. This is all the more true in a museum context given the diversity of nationalities that co-exist during each visit. The reactions to co-presence are probably different according to culture or nationality, as well as the specific use of a mobile application during a museum visit.

Although the respondents were questioned via in-depth interviews, it could help to observe their post-visit reaction—online, for example. Observations in the same museum and with the same imposed mobile application would make their statements more reliable. From a methodological point of view, an observational survey of the way an application is used during a visit based on level of attendance and co-presence can also provide a way to develop our results further and have them complement the interviews. It would also help to compare different types of museums (historical, scientific, contemporary, and so on) by controlling different types of variable (age, children's presence effects, co-presence level, type of companion, and type of group). A better understanding of these elements would undoubtedly refine our results. Lastly, the study could be renewed in other consumption contexts, such as tourism offerings (such as smart cities), restaurants, or theme parks, which share some consumption patterns with museum visits.

**JEL classification: M31 Marketing**

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**Table 1**  
*Characteristics of the Sample*

<b>Number of Respondents</b>	27 consumers
<b>Sex</b>	19 females 8 male
<b>Average Age</b>	35.6 (aged 17–67) Three age ranges considered: - aged 15–25 (young) - aged 26–45 (adult) - aged over 46 (older)
<b>Job Type</b>	Executive (10), senior manager (10), student (7)
<b>Area of Residence</b>	Paris (15), small cities (12)
<b>iPhone/Android</b>	Android (12), iPhone (15)
<b>Application Use</b>	Never or infrequently (16), very frequently or always (11)

**Table 2**  
*LIWC Salient Social Dimensions*

Comparison of the proportion of dimension allocated to each category with the average proportion	LIWC salient social dimensions	Positive emotions	Negative emotions	Social dimension	Family and friends	Anxiety
Gender	Women	-1%*	-11%	-1%	-2%	
	Men	3%	26%	3%	5%	
Age range	15–25	4.3%	-30.3%	-8.0%	12.6%	-44.2%
	26–45	3.2%	13.1%	8.7%	-12.8%	24.4%
	Over 46	-19.9%	-9.9%	-11.4%	9.9%	-41.9%
Number of children	0	1.3%	1.5%	2.8%	-18.8%	
	1	1.3%	-22.6%	-18.9%	-32.3%	
	2	-3.9%	4.1%	1.5%	27.1%	
	3	5.3%	4.5%	3.4%	30.1%	
Mobile application user	Major user (very frequently or always)	9.5%	-17.9%	-8.3%	0.8%	
	Minor user (never or infrequently)	-4.8%	9.1%	4.1%	0.0%	

\* *Note to read this table.* For example, the proportion of terms mentioned by women relating to positive emotions is 1% lower than the average proportion of terms referring to positive emotions and mentioned by all respondents.

**Table 3**  
**Perceived Co-presence When Using a Technological Intermediation Tool**

		Type of Co-presence	
		Companions	Non-companions
<b>During the Visit</b> <i>Illustrative quotations</i>	<ul style="list-style-type: none"> <li>- <b>Facilitate and improve the in-group social contacts</b>  <i>“I go there to discover something with someone. I was there with my grandchildren, but it could also be with a friend. With people who appreciate art, or with children for culture. The other people who are coming with me are a driving factor. Otherwise, I stay in my chair to yawn.” (Laurence, age 57)</i>  <i>“In the application I downloaded, a lot was missing: no “format” of the visit according to the context or who you are with; then the visit is not the same.” (Nathalie, age 47)</i></li> <li>- <b>Create a bubble of intimacy</b>  <i>“I find that in the application there’s a form of intimacy. I look at what I want, no one will know. And so the side that I find great if you’re far away. An intimate side that I really appreciate.” (Laura, age 34)</i></li> <li>- <b>Transmission of knowledge</b>  <i>“I enjoy using the apps if I take a child, like my niece, for example, for a playful visit, if it helps me to make her want to visit the museum.” (Philippine, age 19)</i>  <i>“When you visit, the app could offer age-specific paths. You could bring your children of different ages or school levels, for example, and everyone could find an interest in it if it was adapted. It would allow us to exchange with them, it’s nice.” (Estelle, age 39)</i></li> <li>- <b>Missing out on experience</b>  <i>“When you’re with someone, the application cuts off communication. I find that being in a museum and glued to your phone isn’t really interesting.” (Juliette, age 18)</i>  <i>“If I’m with a friend, I won’t stay on my cell phone. It prevents communication with others. When others do that, check their phones, it annoys me. It’s rude.” (Jennifer, age 17)</i>  <i>“For me, the goal in a museum is to look at the museum and not to look at my phone during the whole visit, or something other than the artwork, the building.” (Marie, age 37)</i></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Protect oneself from the crowd</b>  <i>“If I could, I would do all my visits with a guide, but the problem is that there are so many people. The guides are talking, and the crowd might disturb me, you need a little quiet. If there are too many people, the application on my phone could become a real solution.” (Josiane, age 67)</i>  <i>“When we saw the crowd, we were thinking ‘Oh, it’s going to be boring’, but finally with this [the application] it was well managed. We really enjoyed the exhibition. It was well arranged, we didn’t feel too much the presence of others, and we really enjoyed the works.” (Aude, age 35)</i></li> <li>- <b>Can disrupt social ties</b>  <i>“Instead of creating a link, it breaks links, it destroys human relationships, it breaks the link, it is too virtual, it places you in a world where you lose part of the quality of the interaction between humans. This makes relationships artificial. It isolates people.” (Baptiste, age 36)</i>  <i>“If everyone consults the app, then if we’re all in our bubble listening to individual comments, it’s lame. I’ve never used an audio guide because of this [. . .] we are too disconnected from the world.” (Gaétan, age 27)</i></li> <li>- <b>Complete or supplement the role of frontline employees</b>  <i>“I very rarely use guides, except abroad, when you have no choice. Otherwise, it annoys me, it’s too constraining. Often, I find them a bit lame or not friendly. I prefer a machine that tells me things. That’s for sure. The app would replace the guides, that’s for sure.” (Marie, age 37)</i>  <i>“I find it very useful to come up with a nice and smart application. And then on the spot, especially in the great museums, you get lost a little. Or you can take a guide. And that bothers me.” (Gaétan, age 27)</i></li> </ul>	
	<b>Outside the Visit</b> <i>Illustrative quotations</i>	<ul style="list-style-type: none"> <li>- <b>Extend social discussions around the visit</b>  <i>“The application to plan a possible outing for two and find the most suitable one would interest me. It would be with the person who accompanies me to the exhibition. We’d do it together ahead of time.” (Albéric, age 18)</i>  <i>“I would use this app before and during the visit. With my son, even maybe after to debrief him, but in this case, I would need a more detailed app with all the works. A complete virtual visit could be used for this. It would be quite good and useful.” (Vincent, age 36).</i></li> <li>- <b>Knowledge accumulation</b>  <i>“I follow all day on my phone and when I feel like it I watch, I try to cultivate myself. It lets people like me who want to improve themselves but who don’t make the effort to get out and go to a museum do so from their sofa.” (Laura, age 34)</i></li> <li>- <b>Recommendation to use the application after the visit</b>  <i>“I will recommend it to my colleagues; I have a lot of colleagues who go to museums and use applications. It’s not that entertaining, but if it fulfills its function.” (Pauline, age 31)</i></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Anticipate avoiding crowds</b>  <i>“At any rate, if I think there’ll be too many people, I don’t go. So it’s better to have an application to know the museum anyway. Nevertheless, it’s true that if the application gives me schedules and shows the visitor traffic, I could see.” (Josiane, age 67)</i>  <i>“Preferred schedules, which let us come at times when there are fewer people—that I find very important.” (Romane, age 19)</i></li> <li>- <b>Extent of social contact</b>  <i>“Why should you go on your phone more than on your computer, for example . . . Oh, I found it! Here, for the games or to remember the visit as a fun experience for the kids. Or also to allow you to meet other visitors, with whom you share interests and exchange, share your feelings about the visit.” (Aude, age 35)</i></li> </ul>
<b>Emotions</b>	<ul style="list-style-type: none"> <li>- Rather <b>positives</b></li> <li>- Mostly for the youngest (aged 15–25) and the oldest (over 46)</li> <li>- Mostly for consumers with no child or two children and more</li> <li>- Except for consumers who have low application use</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Negatives</b> during the experience, and <b>more positives outside</b> the consumption episode</li> <li>- The adult category (aged 26–45)</li> <li>- Mostly for consumers who have low application use</li> </ul>	

**Table 4**  
*Social Goals of the Mobile Application and Implications*

<b>Mobile Application In-situ Functions</b>	<b>Mobile Application Social Tools</b>	<b>Nature of Experience</b>	<b>Stakeholders Involved</b>	<b>Example of Implications</b>
<b>Interpersonal Communication</b>	Extend social contacts via application, chats, reviews, etc.	Extended experience	Companions and fellow customers	- Create a “we” of connected visitors (socializing function)
	Facilitate and improve the quality of in-group social contacts	Enhanced experience	Companions	- Prolong the individual or collective experience with others (photo sharing, participating platform) - Improve practicality/support for additional mediation devices, geolocation of companions during visits - Create well-defined areas of social interactions to facilitate the intertwining of virtual and physical interactions (without disturbing other visitors)
	Complete (or supplement, if required) the role of frontline employees	Service experience	Frontline employees	- Help, additional advice on the visit, answers to questions in a way complementing those of the employees
<b>Focusing and Inward-looking Attitudes</b>	Create a bubble of intimacy	Individual quest for immersion	Individual	- Create quiet or calm zones reserved for more intimate experiences - Encourage immersion through music (musical journey)
	Protect oneself from the crowd	Suspended experience	Companions	- Improve the duration of the museum visit, reduce waiting times by anticipating the density of each area based on its interest (e.g., Mona Lisa vs. a less famous painting). Focus the museum service on something different than the other people present - Recommended path according to the crowd in the room
<b>Transmission</b>	Educational tool	Sharing cultural values	Companions (esp. children)	- Create playful channel for children and for parents
	Mediation tool	Discovery experience	Frontline employees	- Offer interaction via the application with museum professionals based on their sensitivity to art (e.g., expert: scenographer, curator; or non-expert: reception and service staff) - Create virtual and social interactions steps (e.g., digital tools with an artwork, individual or collective automatic selfie in front of a famous artwork, create more playful areas in which people can interact with the younger ones as an example)