From Map Using to Map Making: The Museum Experience Through Social Meaning Mapping

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Abstract: This article introduces Social Meaning Mapping (SMM), a digital qualitative tool designed to be used by museum visitors in groups post-visit during a researcher-led session. SMM is embedded in a tablet-based app called Visitracker used to collect data in museums through surveys and timing and tracking of visitors' interactions. For SMM, visitors are invited to recount their experience in a museum room verbally and visually by marking it on an illustrated floor plan displayed on the tablet along with digital paint tools. The app records both visitors' talk and their markings. This paper discusses SMM and its methodological contribution to exploring aspects of the museum experience by drawing upon data from a collaborative study at the Austrian Gallery Belvedere. The findings suggest that SMM enables researchers to capture aspects of visitors' previous experience and knowledge which become relevant in interaction with the physical and social context of their visit.

Keywords: informal learning, museum, visitors, digital maps

Introduction

Most cultural institutions today aspire to provide meaningful and engaging visitor experiences. Audience research explores the ways in which museums can create and foster meaningful encounters by improving museums' knowledge of their visitors and their experiences on site. Different theories, methods and tools have been used to collect data from visitors, with surveys and timing and tracking among those methods mostly used (Grack Nelson & Cohn, 2015). Specifically, for timing and tracking, researchers mark visitors' movement, pauses, dwell time and other behavioral data on printed copies of the museum's floor plan (Yalowitz & Bronnenkant, 2009).

Following recent technological advances, a tablet-based app called Visitracker was designed to transpose timing and tracking studies and surveys from pen and paper onto a digital format, aiming at enhancing and facilitating data collection and visualizations (Pierroux & Steier, 2016). To complement the affordances of this app, a digital research tool coined Social Meaning Mapping (SMM) was designed and embedded in Visitracker (Christidou, 2019). Both SMM and Visitracker were informed by sociocultural theories of learning (Vygotsky, 1986; Wertsch, 1991), with the analytical focus on interactions of visitors in groups.

This paper introduces SMM as an analytic tool and a lens to explore the ways in which museum designs are being experienced by visitors. It presents the tool and exemplifies its use by drawing upon data from the 'Belvedere Visitracker' study, an interdisciplinary collaboration between the Department of Education, University of Oslo, and the Department of Art History, University of Vienna, designed and led by the two authors.

Social Meaning Mapping (SMM)

SMM was developed to address the need for a responsive research methodology accounting for visitors' agenda and allow them "to flourish and come to the front in data collection or analysis stages" (Adams, Falk & Dierking, 2003, p. 19). Following the longstanding use of maps in museum practice (i.e. for a review, see Yalowitz & Bronnenkant, 2009), SMM displays an illustrated floor plan of a museum room on the tablet's screen along with several digital paint tools (Figure 1a). During a researcher-led session, visitors are prompted to use the tablet post-visit and recount their experience both verbally and visually by marking on its surface. The app records both visitors' talk ('ways of talking') and the markings ('trails of walking'), which are both significant in uncovering their experience. As these are not separate entities, a video is created that enables their simultaneous analysis (Figures 1b; 1c). Visitors combined 'trails of walking' and 'ways of talking' are explored as multimodal accounts of their temporally, spatially and socially organized interactions in the museum room (Christidou & Reitstätter, 2019).
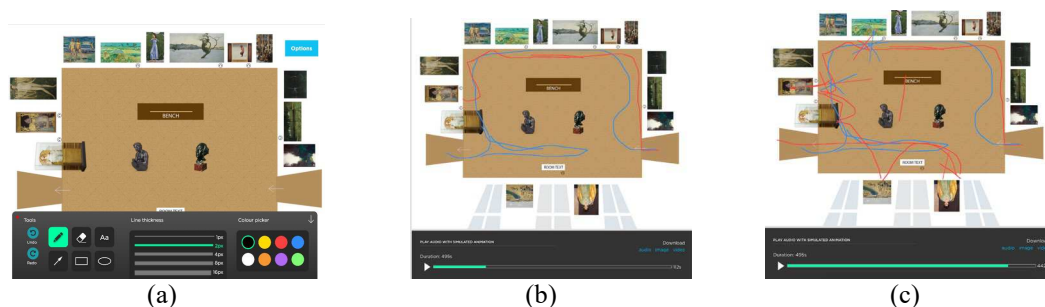
Figure 1. (a) The SMM interface; (b) Synchronized SMM at 01:86 min; (c) Synchronized SMM at 07:34 min.

Methods

The 'Belvedere Visitracker' study is a micro-investigation of one gallery room on the first floor of the Upper Belvedere, following the recent rearrangement of its permanent collection. The room displays 13 paintings and three sculptures from the turn of the 18th century of the Viennese avant-garde group Secession and their international colleagues. An identification label is mounted next to each artwork, with an additional interpretive label accompanying *The Plain of Auvers* (1890) by Vincent Van Gogh, *Adolescentia* (1903) by Elena Luksch-Makowska, and *Judith* (1901) by Gustav Klimt.

Our research question explored how visitors in dyads move and make sense of the artworks and interpretive resources in the Secession room (Christidou & Reitstätter, 2019). It builds on previous research foregrounding the social nature of museum visits (Coffee, 2007) and takes a sociocultural approach to meaning making by focusing on visitors in groups and their experience as a unit.

Data collection

Data collection took place during a week (Monday-Sunday) in late September 2018, distributed in such a way that covered the whole daily and weekly opening times. Each one of the five research team members carried a tablet, a university identification card and a clipboard with a pen and a consent form in English and German. Visitors in dyads were approached at the museum staircase and the researcher introduced herself, the project's objectives and data collection stages. If the visitors were positive and older than 18 years old, they were handed the consent form to read and sign.

We collected data with the Visitracker app through (1) timing and tracking, (2) a short survey consisting of twelve questions on visitors' sociodemographic background and visiting practices (i.e. gender, age, nationality, country of residence, frequency of visiting museums, reasons for visiting the Belvedere), and (3) one SMM created by the two visitors. The timing and tracking took place at the Secession room while both the survey and the SMM took place at the Oktogon Room, a near-by room usually used for small events. For SMM, the researcher handed the tablet to visitors while offering the following prompt while addressing both visitors at the same time: *please mark the way you took through this room by using the toolbox available. As you can see, there are different shapes, colors, and an eraser for you to use. While drawing please also share your thoughts on your visit. Everything that comes to your mind is of interest to us.* Once visitors signaled that they finished their task, the researcher asked them to mark with an *x* the artworks they have seen before and with *an arrow* their personal highlight while reasoning their selections. During each SMM, the researcher posed various questions to visitors to elaborate on their thoughts and markings. After finalizing their SMM, visitors were offered a thank-you card with the contact details of the two principal investigators, and a small gift donated by the museum. The average duration of data collection was approximately 25 minutes.

Participants

We recruited seventy-six pairs of visitors (N= 152); 21 female pairs, 8 male pairs and forty-seven of mixed gender. Thirty-one nationalities were represented in our sample, with the majority being Germans (n=19), followed by Italians (n=16), Americans (n=15) and Japanese (n=12). Almost all visitors (97%) came to Vienna as part of a trip and visited the Belvedere for the first time (90%), with a small segment (10%) visiting the museum two to five times before. In comparison to the dataset collected through the museum's ticketing system in 2018, our sample – consisting mainly of international tourists, is representative of the demographics of visitors to the Upper Belvedere. In addition, most visitors identified themselves as 'family' (53%) and 'friends' (33%), hinting at a high degree of familiarity between them.

Data analysis

The timing and tracking dataset was visualized on the Visitracker portal through automatically aggregated heatmaps and movement maps (Figure 2a and 2b) that facilitated the identification of (a) visitors' movement direction in the Secession room, and (b) the areas where most interactions took place.
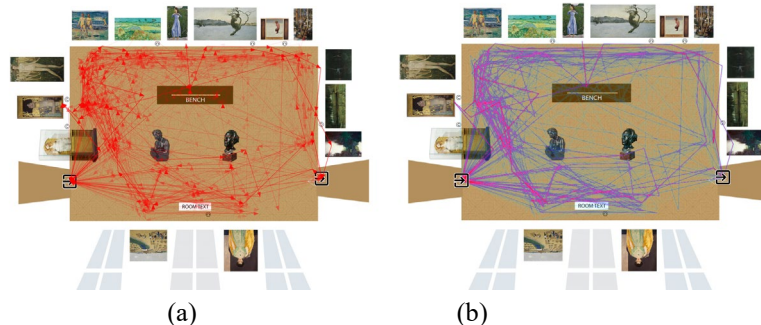

(a)   (b)

Figure 2. (a) Movement patterns of all visitors; (b) Heatmap of movement of all visitors.

SMMs were analyzed in two stages: first, through a visual analysis, where we explored the ways in which visitors used the maps (i.e. how they marked their experience on the digital floor plan). Then, we transcribed all maps including visitors' talk and markings to multimodally analyze the ways in which they communicated and represented meaning through their map making (Kress & van Leeuwen, 1996). Visitors' talk was transcribed on the left side with a screenshot of the accompanying marking activity on the right side (Table 1). Working with the qualitative data analysis program NVivo, we first applied a quite broad coding scheme in accordance with the design of the study. The codes categorized statements on artworks as 'seen before', 'highlight' or as simply 'talked about'. Other codes referred to the interpretive resources in the room such as 'text' or 'audio guide' information or the exchange with the visitor's 'companion'. Prominent phenomena that we encountered during field research such as 'crowding' were also included in the coding scheme as well as methodological reflections on the interview situation with e.g. 'language issues'. The aim was to get an overview of the data and prepare smaller thematic units organized by these codes.

We then analyzed these thematic units through additional inductive coding by developing interpretive codes grounded in the data (Corbin & Strauss, 2008). These codes such as 'short-cut visit' or 'finally seeing the original' refer to patterns that become salient in the interpretive analysis of the verbal statements and visual markings. In doing this, we moved iteratively from codes related to type of markings visitors made on SMM and objects that they marked out or talked about to identifying aspects of the personal, physical and sociocultural context of each visit that became salient.

Results

The timing and tracking data provided us with a detailed account of the use of space in the Secession room. The average time visitors spent in this room was approximately five minutes (min= 30 seconds, max= 26 minutes). This high variance in the dwell time can be linked to the situational dimensions of each visit which is also often reasoned during their SMM (i.e. crowding, listening to audio guide, level of art interest). Based on the direction of the movement lines in Figure 2a, the majority of visitors followed a turn-right movement pattern, exploring the room anti-clockwise and avoided the area in the center where the two sculptures are positioned (Figures 2a; 2b), with the top left corner of the room being heavily occupied. This dense use of space on the top left corner can be linked to the display of works by famous artists, including *Judith* by Gustav Klimt; the second most prominent artwork of the museum.

The timing and tracking data became better understood through the analysis of the survey data, which informed us on visitors' sociodemographic background and visiting practices. For example, we see that visitors who reported in the survey that they tend to visit museums together, stayed in close proximity with each other during the visit in the Secession room and performed more social interactions between them (i.e. talk to each other, point at aspects of the artworks). Based on previous research, visitors' type of group and the degree of social ties between them inform the time spent in the museum as well as their movement path (Tröndle, Wintzerith, Wäspe & Tschacher, 2012; Tolmie, Benford, Greenhalgh, Rodden, & Reeves, 2014).

Based on a visual analysis of all 76 SMM, we observed that visitors either represented their experience as one trail (n=24) or as two trails (n=52) (Figure 3). Visitors often marked two trails to 'tell two stories' and others used one trail to 'tell one story' as they felt that they experienced most of the room together. This became

evident in the survey when asked if they experienced the room along with the other person or on their own, and in the SMM data with visitors mentioning that they walked through the room together. We also visually analyzed the SMMs made by the pairs in comparison to the movement maps created through the timing and tracking by the researchers. Interestingly, we identified a high degree of similarity between those. This points to the potential validity of both researchers' observations and visitors' acts of representation while foregrounding the benefits of combining these methods.

(a)

(b)
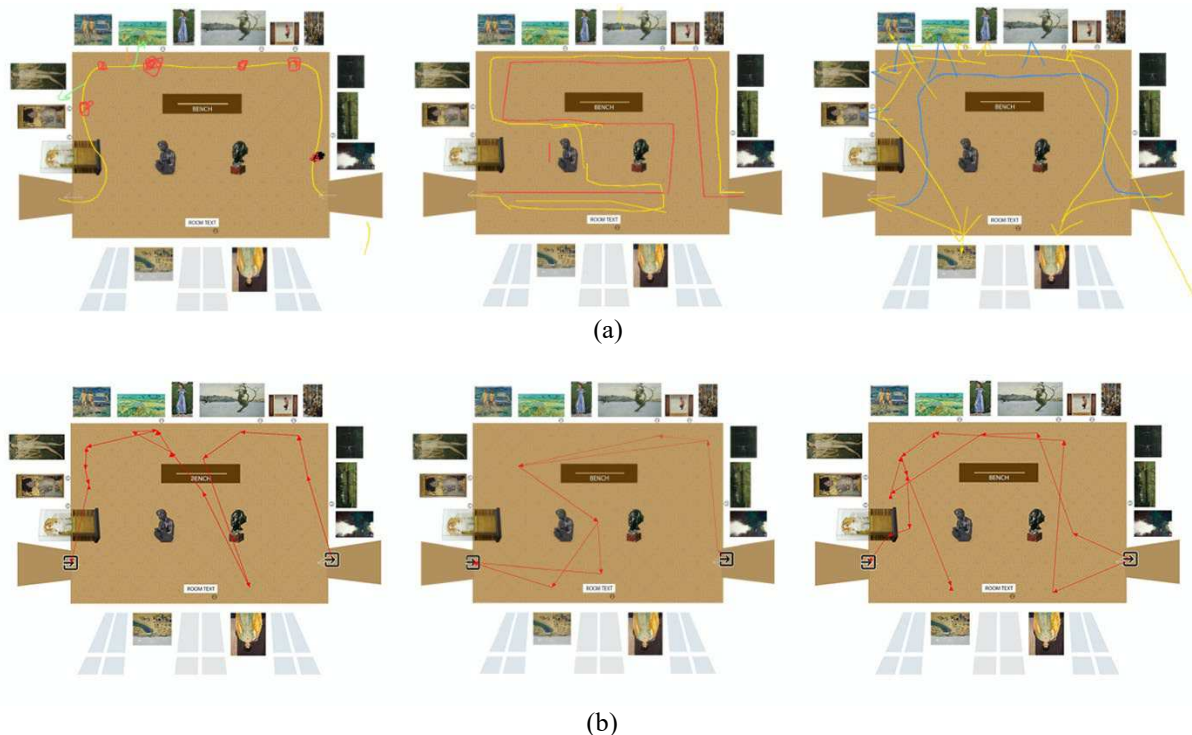
Figure 3. (a) SMM created by visitors; (b) the associated maps created through timing and tracking.

We also analyzed any marked areas or artworks of interest and a quantification of the artworks that visitors identified as 'seen before' or 'highlight' (Figure 4). Among the 'seen before' artworks, the top three are paintings accredited to world famous artists such as Gustav Klimt, Vincent Van Gogh and Edvard Munch (*Judith*; *The Plain of Auvers*; *Seashore*). Based on a content analysis of their conversations, visitors mentioned that they had encountered reproductions of these paintings mostly in art books, museum stores, advertisements, and pop cultural objects. The top three 'highlights' include also *Judith* by Klimt and *The Plain of Auvers* by Van Gogh, along with *The Evil Mothers* by Giovanni Segantini.

We also categorized artworks into a third group called 'talked about', including those artworks mentioned during their SMM. The six most frequent discussed artworks in this category include those identified as seen before' and their 'highlights' (i.e. *Judith*; *The Plain of Auvers*; *Seashore; The Evil Mothers*) and a number of newly introduced artworks such as *Lost* by Franz Von Stuck and *Pond* by Wilhelm Bernatzik. This analysis demonstrates a certain preference for visitors selecting artworks based on a high degree of familiarity but also exemplifies instances when they were exploring unfamiliar artworks and artists that elicit their personal interest during their visit. Reasons for engaging with these 'new acquaintances' are the artworks' related impressiveness (i.e. color, style, technique, topic) and the richness of associations that are triggered (i.e. personal memories, formal and informal knowledge, hobbies).

To illustrate how the three main codes of "seen before", "highlight" and 'talked about' and other inductive codes became salient in the analysis of single SMMs, we include here the example of an American couple, a male adult (M) and a female adult (F) visiting the Belvedere for their first time, interviewed by the researcher (I). In analyzing this transcript with the map in making (Table 1), we explored visitors' reflection both *on* and *in* action (Schön, 1983) – that is, talking and thinking aloud about what they draw on the floor plan while considering events that have occurred.
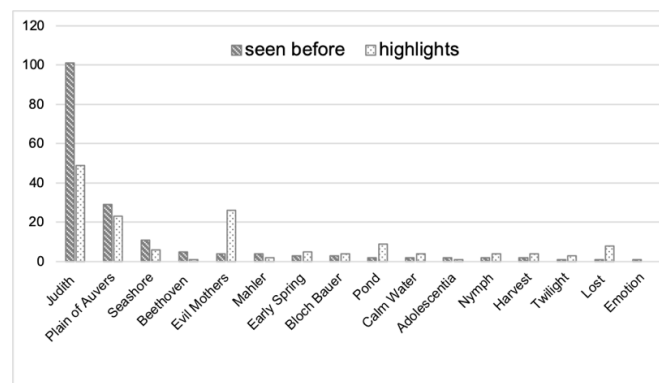
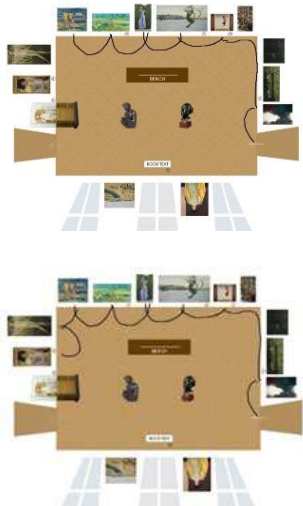Figure 4. 'Seen before' vs. 'Highlights.

Based on the artworks the male visitor 'talked about' or marked on the digital floor plan, we gained a better understanding of the reasons why he approached those artworks. These include: (i) the artworks' visual properties (i.e. 'the look of anguish on his face') that became more salient due to their personal relevance to his life ('I am a fisherman. And so, it looked like a pretty inviting place to fish'; 'I know that look very well because I get lost a lot'); (ii) familiarity with the artist ('It was a lot of fun to see a Van Gogh'; 'This one by Edvard Munch'); (iii) knowledge in art history ('I said that's Van Gogh'; 'Edvard Munch was a very depressed young man'); and (iv) previous art experiences ('reminiscent of *La petite dejeuner* by Manet in France'). We also hear him naming sometimes the artists and the artworks ('and I liked this painting [...] the Pond', 'really like this one called Lost') which hints at his art expertise and that he was reading the paintings' label text.

Contrary to his black colored "trail of walking" that refers to almost every artwork on the wall, one after the after, the female's visit is given in a green parallel line. It follows the same direction as the male's line but includes stops at only two artworks. Coupled with her very brief 'way of talking', we consider her a 'tag along' visitor who 'followed' the male visitor ('What did I do? I followed him'). There are no strong claims suggesting art interest or art knowledge. Instead, there is a brief explanation offered as to why she walked in the way she did, for which she draws a comparison to her co-visitor ('Because I don't see things the way he sees things. I don't do art'). What is interesting to point out here is the fact that her own understanding of herself as 'not doing art' informs her visiting practices, which are 'to figure out what they are trying to represent' and 'kind of walk by and look at the titles'. In such cases, where we encounter inductive codes such as 'lack in trust in one's own visual interpretation' and the 'need for contextual information,' we argue for the importance of the design of interpretive resources to encourage a "close looking" at the artworks and facilitate visitors' individual interpretations (independent of a lack or existing art knowledge).

Table 1: Transcript of SMM nr. 6

Timestamp	Ways of talking	Trails of walking
00.58	M: (marking in black) I went here, and I liked this painting very, very much, the *Pond.* It's really beautiful	
01:01	I: Because?	
01:03	M: I am a fisherman. And so, it looked like a pretty inviting place to fish. And like, yeah, looked like the pond was either in the early morning, which is when I would go fishing, or perhaps in the late evening. And then, I sort of zoomed across like this, just glancing at these paintings [referring to Calm Water, Twilight and Early Spring]. But I really like this one called *Lost.* Because this, I almost thought it was, what you call this, a satyr? Because he's got this sort of	

01:38	I: What is a satyr?	
01:40	M: It is a half man, half goat.	
01:43	I: Ah, okay, I see your point (laughs)	
01:46	M: But the look of anguish on his face, I know that look very well because I get lost a lot.	
[....]	[....]	[....]
02:37	M: It was a lot of fun to see Van Gogh [Plain of Auvers]. It's always fun to see Van Gogh. I did not expect to see it.	
02:42	I: Ah, because why don't you expect to see a Van Gogh at the Belvedere?	
02:44	M: You know, Van Gogh is so much associated with France. I did not expect to see it here, of course they are all over the world, but you know, the moment I laid my eyes on that, I said that's Van Gogh or somebody very close to Van Gogh. This one [Seashore] by Edvard Munch, I liked that very well. In fact, I told my wife that Edvard Munch was a very depressed young man. He was very religious, very, and his paintings were very gloomy, kind of dark-looking. And then, he, I believe, goes under psychotherapy with Jung. And afterwards, he comes out and he is very organic and all these pretty bright colors and so on. This painting [Adolescentia] I forgot the name of the artist or the painting. But it was reminiscent of *La petite dejeuner* by Manet in France, where, it's about the same time I think too, turn of the century, where you have these naked figures walking around the park. But of course, *La petite dejeuner* has clothed figures as well as the naked figures. And then, this little pretty [Judith]. How do you say this woman?	
[....]	[....]	[....]
06:09	I: Yeah, but what did you do? (addressing W)	
06:10	W: What did I do? I followed him.	
06:11	I: You followed him? (laughs) Was it really like this? Yeah, what would you add in your turn around in your walk through?	
06:20	W: I don't know.	
06:21	I: You can even pick another color if you want here.	
06:24	W: I will pick a different color. So, I will go with green (marking with green). But no, but I just, I go around and I just look at, (I mean in fact) I look at the titles and then I just walk by and I look at it and see if I can see it.	
06:40	I: And do you often, do you always look at the titles?	
06:42	W: I try to, because I try to figure out what they are trying to represent. Because I don't see things the way he sees things. I don't do art. So, that's why I just kind of walk by and look at the titles and say yep, okay, oh that is [Plain of Auvers]	

07:00	M: She knew that one	
07:01	W: Knew that one. [Plain of Auvers]	
07:03	I: So, you recognized	
07:04	W: I recognized it, yeah. But then I looked at that one [Adolescentia] and then I just kind of walked, passed out the door.	

Limitations

Despite the great potential of SMM for exploring visitors' experience in depth, collecting data in one room captures only a snapshot of the museum experience (Adams et al. 2003). Furthermore, asking visitors to share their experience using a digital floor plan perhaps values spatial and retrospective knowledge over embodied knowledge *in situ*. Similarly, the tablet might minimize "accessibility, visibility, and 'shareability''" (Rogers & Lindley, 2004, p. 1134) between the visitors as it allows only one person to interact with it at a time.

Conclusion

Both the timing and tracking and especially the SMM tool contribute to the collection and visualization of data regarding visitors' movement patterns and aspects of their experience, including their personal, physical and socio-cultural background. They also allowed for a participatory way of interviewing visitors and foregrounding their agency in data collection and analysis. Specifically, visitors were not only prompted to 'see themselves' but also 'write themselves' on the floor plan, bringing their personal experience from the recent past into the present.

By doing so, SMM allowed us to explore aspects of visitors' emplacement and how an understanding of this room emerged through the performance of experiencing it, rather than based on its curatorial design (Roppola, 2012). Moreover, the use of the digital floor plan with images of the artworks on display mediated visitors' talk about their art experience without needing to recall the artists and the paintings' names. In this sense, we were able to identify what visitors represented as salient in this room. In an 'act of representation' – that is, 'the act of highlighting aspects of our experience and communicating them to others and ourselves' (Enyedy, 2005, p. 427), making the SMM evoked reflection regarding the individual's own ideas and prior knowledge, further elaborated or contrasted through the input offered by the co-visitor.

SMM aimed at foregrounding visitors' agency by including their 'voices' in data collection and analysis. Visitors became map makers from simple map users. The static floor plan was transformed into a 'dialectical artefact' (Stahl, Ludvigsen, Law, & Cress, 2014, p. 239) produced by visitors in collaboration with each other and in interaction with the affordances of the SMM tool (i.e. tablet's screen, toolbox etc.). Furthermore, by inviting active participation, very personal relationships were created between the researchers and the visitors despite the short temporal duration of our encounters during the data collection, often extending the conversation beyond the specific purpose of the SMM. The researchers also became map makers, as new maps were created through the visualization of timing and tracking dataset.

On this extended map-making base, it is possible to make suggestions for current and future exhibitions and curatorial decisions. For example, the aggregated visualizations of movement maps allowed for a detailed representation of paths in the room and pointed towards the areas where 'interactions' took place, or not. These visualizations can help museums identify the areas of 'high' or 'low' engagement and also point towards issues that emerge when several visitors occupy the same space at the same time (i.e. crowding). Aspects of the artworks that visitors found interesting, challenging, attractive or not that become foregrounded in the SMM data can also inform future exhibition activities and the design of interpretive resources.

Through the SMMs, we 'saw' and 'heard' which aspects of the curatorial design visitors were attracted to, which they avoided or could make more or less relate to. Nonetheless, what is shared through map making is not merely a list of resources, objects or places, but a narrative path, which placed these objects in a spatial, temporal, and categorical context. These maps are more than representations of what happens during the museum visit – they are representations of relations, and thus, more holistic accounts of visitors' experience in the museum space.

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