New Methods for Measuring Shared and Divergent Visitor Experience: A Pilot Study at the Royal College of Music Museum

Neta Spiro[1,2], A.C. Harkness[3], Arianna Rigamonti[1], Gabriele Rossi Rognoni[1], Michael F. Schober[3]

[1]Royal College of Music [2]Imperial College London [3]The New School for Social Research

We report on a new method for anonymously measuring shared and divergent museum visitor reactions to specific content of exhibits, going beyond more general standardized evaluations of overall experience. In a small pilot study, six visitors reported three things that had most struck them about their visit, and they later rated the extent to which they agreed with other visitors' anonymized reports. The method reveals which objects generate more and less attention and interpretive consensus and the extent to which visitors understand museum content as curators hope. It also allows assessment of which museum materials (display text, audio, video, tour script) contribute to visitors' commentary and how differently different kinds of visitors experience the museum. Expanded versions of this method could inform iterative exhibit development, and interactive representations of data sets like that collected here could allow exhibit designers and curators to gain insight into visitor experience from alternate perspectives.

INTRODUCTION

We report findings from a pilot study with a small number of participants in a university museum to develop a new method for measuring shared and divergent visitor experience, demonstrating the kinds of research questions and answers that analyses of these sorts of data allow.

While substantial work and theorizing has gone into evaluating museum visitors' experiences, less has focused on museum-goers' impressions and thoughts about specific exhibits, and very little has measured the extent to which visitors overlap with other visitors in their impressions and thoughts. The method we introduce here pools small sets of specific reactions and impressions (not particularly burdensome to produce) collected from individual visitors immediately after their visits. We later ask them to rate their agreement with anonymized specific reactions and impressions from other visitors—thoughts that they would typically not encounter during a visit. (In many museums, visitors may get a bit of access to some other visitors' thoughts in comment pages or grafitti walls, and they may leave traces of their own thoughts for other visitors. They may also glean some evidence of others' thoughts in conversations that they overhear during their visit or with others in their party during or after their visit. But researchers ordinarily do not have access to a more collective sense of visitors' impressions of each other's impressions.)

The intention is to gather honest reactions to others' comments without asking visitors to openly contradict others, as they might be asked to do in a synchronous conversation or focus group. It also allows assessment of the extent to which visitors spontaneously report or agree with museum professionals' hopes for what an exhibit communicates, and how the textual or audiovisual material informs visitors' impressions.

The objective is to develop a framework for measuring visitor shared experience and collective cognition that can apply to spaces, environments and events more broadly, in addition to and beyond informing iterative museum design.

BACKGROUND

The focus of most research on visitors' experiences of museum exhibits has been on developing standardized tools that can apply across a range of different kinds of content (Foster, 2020). Measures have included observing visitors' behaviors—from where they spent time for how long (Serrell, 1998) to eye-tracking (Damala et al., 2013) and even their galvanic skin response and heart rate (Peng, 2019). Yet more measures have asked visitors to evaluate their satisfaction with their visit, their intention to return, their reasons for and expectations about their visit, whether they felt they had learned from the experience, and their emotional states and sensory experiences during the visit (e.g., Brida et al., 2013; Falk, 2006; Falk & Dierking, 2000; Packer, 2008; Pekarik et al., 1999, among many others). Other work has focused on longer-term effects on museum-goers' well-being and social impact more generally (e.g., Mileham, et al., 2023; Thomson & Chatterjee, 2022).

Far less work has focused on understanding visitors' reactions to specific content in museum exhibits, although some of this is likely uncovered in methods that ask visitors to think aloud during their visit (e.g., Dufresne-Tassé & Lefèbvre, 1994; Peng, 2019), listen in on their conversations while they visit (Carlile, 1985; Lucas & McManus, 1986), or ask visitors to report about their experience in writing (Adams et al., 2003; Sheng & Chen, 2012). One method that does intend to capture the specific content of visitors' experience is the "Learner Report" (Haanstra, 2003), which asks visitors to respond to statement stems such as "I have experienced/learned/discovered that…" Learner report responses can inform how curators think about the success of the textual and audio guidance that they provide visitors (Haanstra, 2003).

APPROACH

Our method extends the Learner Report approach by assessing the extent to which visitors agree with other visitors' specific impressions, building on methods for assessing overlapping cognition in music performers and listeners (Schober & Spiro, 2016; Spiro & Schober, 2021).

In Nov-Dec 2023 we invited people who had chosen to visit the Royal College of Music Museum, which permanently displays historical Western musical instruments, to participate in a study at the end of their visit, with the incentive of a £20 voucher. Participation entailed completing two online questionnaires: one on a museum tablet at the end of their visit (Phase 1) and one a few weeks later in a place and on a device of their choosing (Phase 2). The Phase 1 questionnaire asked participants to provide three brief descriptions (no more than one sentence) of "three specific things you noticed about the objects that are exhibited while you were going around the museum. These could be about something you learned, what an instrument looked or sounded like, anything you found surprising, informative, positive or negative—whatever you noticed." They were then asked to select, for each statement, the category of object(s) the statement was about (e.g., keyboard instruments, wind instruments, paintings books or recordings, the whole museum, or something else) and then to select the image(s) to which their statement pertained (if relevant). They then answered questions about their experience of the museum, including whether they thought the museum exhibit had a main story and if so what that was; selecting activities they had engaged in during their visit (looking at instruments or paintings, watching videos, reading text and labels, listening to the audio guide, going on the guided tour); about their museum-going and musical experience; and about their demographic characteristics.

The Phase 2 questionnaire asked the six participants from Phase 1 to rate the extent to which they agreed during their visit and also now with the 18 specific statements generated in Phase 1, accompanied by the relevant images. The rating scale ranged from "fully agree" to "fully disagree" and also included "don't understand," "don't remember what I thought at the time," and "don't remember seeing the object(s) in this/these image(s)." They also were asked the extent to which they agreed with each statement now (or "don't understand"), as well as to elaborate on any responses that were not "fully agree" and also to give any further thoughts they had during the visit or now.

Of the six participants in Phase 1, three identified as female and three as male; one reported their ethnicity as Asian/Asian-British, three as belonging to mixed/multiple ethnic groups, and two as White; one reported having a high school diploma, two reported having the equivalent of a bachelor's degree, and three reported having advanced qualifications. Five reported music being "extremely important" in their lives, all reported having played some musical instrument on a regular basis, and all reported being at least occasional museum-goers.

OUTCOME

Range of visit experience

Even this small set of visitors ranged in how they reported having engaged with the exhibits. All six reported having looked at the instruments, but only five reported having read text and labels or looked at paintings. Four listened to the audio guide, three watched any video, and only one went on a guided tour. Four reported having talked with someone else about the museum or its contents during their visit (either someone they visited with or met during their visit), but two did not. Visitors reported visit lengths of from 10 to 90 minutes.

Comments generated

From the six responses to the Phase 1 questionnaire, some objects in the museum generated more commentary than others, and some generated none.

Only one of the 6 participants reported having experienced the exhibit as having a main story (4 others were not sure and one reported that it did not), and this participant's report of what the main story was ("History and cultural importance of musical instruments") did not line up with the curator's delineation of the intended main story, which organized the exhibit by themes of music as creation, craft and performance. This is consistent with Caldwell's (2002) finding that what museum professionals (directors, curators, exhibition specialists, marketing staff) find interesting or enjoyable often may not match visitors' expectations and desires.

Endorsement of other visitors' comments

Based on ratings by the five participants who completed the Phase 2 questionnaire, some objects in the museum generated comments endorsed by more visitors than others (see Figure 1). Three of the 18 statements garnered full agreement on what visitors had thought at the time, e.g. "The exceptional detail on the instruments," "The little pocket violins used for dance were quite interesting and something new for me," and "Hearing the instruments sound was a nice experience that not every museum would provide." Others generated much less agreement, either because responses were polarized (e.g. "The instruments dating to 1800s looked newer than I'd expect" and "The level of detail on the making of some instruments") or because participants did not report having seen or attended to what the comment was about during their visit (e.g. "Haydn became a celebrity when he reached London").

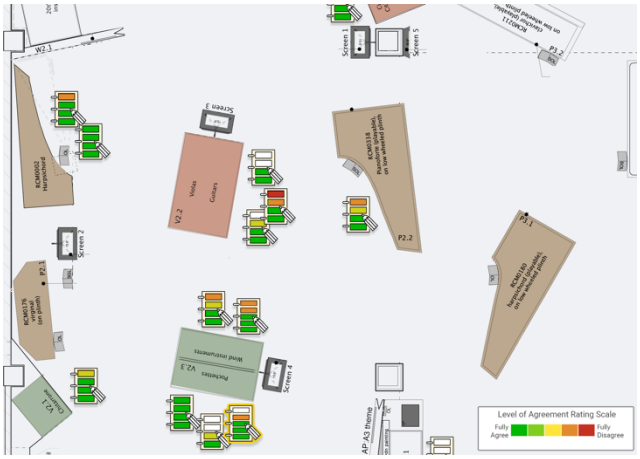

Figure 1. Spatial representation of distribution of commentary and agreement that the comments garnered

The raters ranged in how many of 15 statements (that they hadn't authored) that they fully agreed with during their visit (rating of 1), ranging from 5 (33%) to 11 (73%) (including statements that referred to objects the rater didn't remember having seen or didn't think about at the time). Agreement with statements now was higher but still not 100%, ranging from 8 (53%) to 12 (80%) of 18. If we do not count statements that raters did not understand (6), did not remember what they thought at the time (7), or that referred to objects the rater didn't remember having seen (8) (so counting only non-null ratings, so the denominator is different in every case), rates of agreement are higher but still not universal. For the during-visit ratings, the range is from 56% to 92%, and for the now ratings the range is 57% to 92%, with agreement by three of the five raters below 70% both then and now.

Statements could be disagreed with in different ways, as evident not only from visitors' quantitative ratings, but also from the elaborations explaining their ratings—for example a disagreement with a statement expressing surprise that the pedal harp dated to 1800 in its present form because "I was not particularly interested on this musical instrument." As another example, one participant elaborated on their disagreement with "The clarinet sounds similar to a trumpet and the instrument is used similarly in orchestral pieces" stating "I did not consider it that way," and another who reported not remembering having seen this instrument during their visit now stated "I don't immediately recognise this as a clarinet - it looks more like a recorder." Figure 2 presents additional examples of elaborations, along with the ratings, images, and comments they were responding to.

Lexical and semantic analysis of the comments, along with visitors' reports of the information sources they did and didn't use (display or video text, audio guide, tour), allows tracing of the sources of museum-provided information that could in principle have led to each comment (see Figure 3 for an example showing a potential lexical source). Analyses like these on a larger scale could inform curators and museum designers about the effectiveness of the materials they provide.

The kind of information about visitors' experience generated through this method could, with larger data sets from visitors with a broad range of backgrounds, be broken down or sorted by different categories of visitors: those with greater and lesser prior knowledge about the exhibit content or greater or lesser prior museum-going experience,

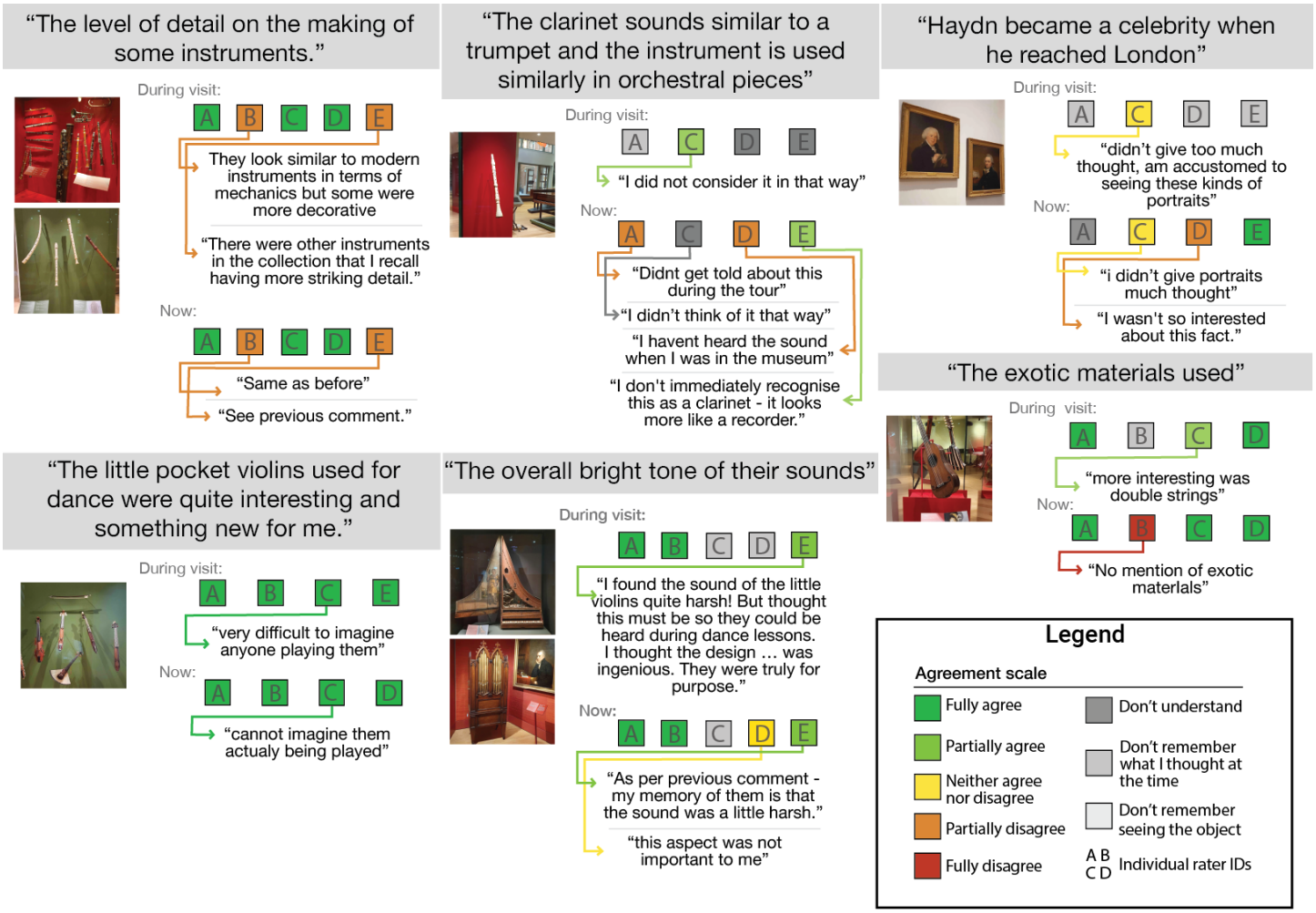

Figure 2. Examples of visitor comments, along with images of the relevant objects in the museum, other visitors' ratings on the comments and elaborations on the ratings.

members of different demographic groups, or those with different reported experience during their visit—e.g., having used the audio guide or not, or having visited for longer or shorter time spans. More detailed knowledge about consensus and dissensus among different subgroups of visitors would provide a level of granularity for museum designers and curators beyond what is currently available.

CONCLUSIONS

The method piloted here opens the door to new ways of assessing visitors' converging and diverging experience, including which objects generate particular attention and memorability, which visitors (e.g., with different levels of prior knowledge or demographic characteristics) experience

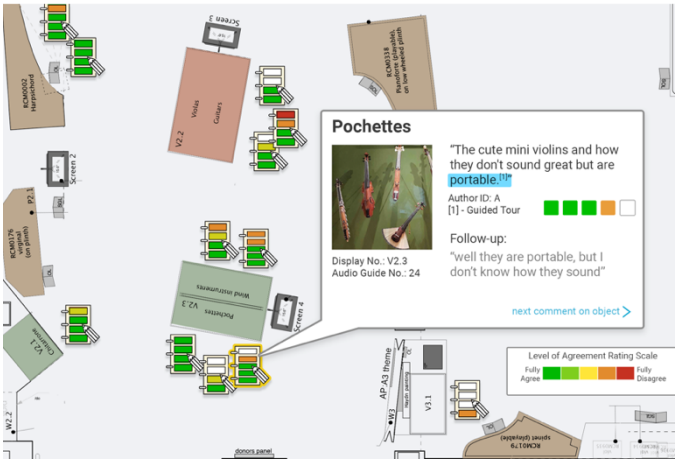

Figure 3. Hybrid qualitative-quantitative representation of one comment

exhibits more and less similarly, and which museum-provided material (display text, audio, video, tour script) does and doesn't make its way into visitors' impressions.

Future extensions include larger scale ongoing data collection piping visitors' exhibit-specific impressions to others, and automated analysis of which museum-generated material most contributes to visitors' impressions. Interactive spatial representations of data sets like that collected here, akin to time-based representations of listeners' converging and diverging experience of a recorded musical performance (Spiro & Schober, 2021), could allow exhibit designers and curators to understand visitor experiences in real time from a range of alternate perspectives, for example clicking to discover which objects generated particular controversy or memorability among which visitor groups.

ACKNOWLEDGMENT

We acknowledge the support of staff at the RCM Museum, particularly Henriette Poos and Richard Martin.

DECLARATION OF CONFLICTING INTEREST

The authors declare that there is no conflict of interest.

FUNDING ACKNOWLEDGMENT

UK Research and Innovation's Participatory Research Fund, administered by the Royal College of Music, UK.

REFERENCES

Adams, M., Falk, J. H., & Dierking, L. D. (2003). Things change: Museums, learning and research. In M. Xanthoudaki, L. Tickle, & V. Sekules (Eds.), *Researching visual arts education in museums and galleries* (pp. 15–32). Kluwer Academic Press. https://doi.org/10.1177/0011128712437913

Brida, J. G., Disegna, M., & Vachkova, T. (2013). Visitor satisfaction at the museum: Italian versus foreign visitors. *Tourism: An International Interdisciplinary Journal*, *61*(2), 167–186. https://hrcak.srce.hr/106866

Caldwell, N. (2002). (Rethinking) the measurement of service. *International Journal of Nonprofit and Voluntary Sector Marketing*, 7(2), 161–171. https://doi.org/10.1002/nvsm.176

Carlile, R. W. (1985). What do school children do in a science center? *Curator*, *28*, 27–33. https://doi.org/10.1111/j.2151-6952.1985.tb01687.x

Damala, A., Schuchert, T., Rodriguez, I., Moragues, J., Gilleade, K., & Stojanovic, N. (2013). Exploring the affective museum visiting experience: Adaptive augmented reality (A 2 R) and cultural heritage. *International Journal of Heritage in the Digital Era*, *2*(1), 117–142. https://doi.org/10.1260/2047- 4970.2.1.117

Dufresne-Tassé, C., & Lefèbvre, A. (1994). Some data on the psychological functioning of the adult visitor at the museum and their implications for museum education. *International Review of Education*, *40*(6), 469–484. https://doi.org/10.1007/BF01102824

Falk, J. H. (2006). An identity-centered approach to understanding museum learning. *Curator*, *49*(2), 151–166. https://doi.org/10.1111/j.2151-6952.2006.tb00209.x

Falk, J. H., & Dierking, L. D. (2000). *Learning from museums: Visitor experiences and the making of meaning*. AltaMira Press.

Foster, Harriet. (2020). *Evaluation toolkit for museums* (pp. 1– 88). SHARE Museums East. www.sharemuseumseast.org.uk

Haanstra, F. (2003). Visitors' learning experiences in Dutch museums. In M. Xanthoudaki, L. Tickle, & V. Sekules (Eds.), *Researching visual arts education in museums and galleries* (pp. 33–48). Kluwer Academic Press. https://doi.org/10.1007/978-94-010-0043-7_3

Lucas, A. M., McManus, P., & Thomas, G. (1986). Investigating learning from informal sources: Listening to conversations and observing play in science museums. *European Journal of Science Education*, *8*, 343–353. https://doi.org/10.1080/0140528860080401

Mileham, M.A., Johnson, E., & Nelson, K.R. (2023). *Museum social impact toolkit*. Utah Division of Arts and Museums. https://museumsocialimpact.org

Packer, J. (2008). Beyond learning: Exploring visitors' perceptions of the value and benefits of museum experiences. *Curator: The Museum Journal*, *51*(1), 33–54. https://doi.org/10.5271/sjweh.453

Pekarik, A. J., Doering, Z. D., & Karns, D. (1999). Exploring satisfying experiences in museums. *Curator: The Museum Journal*, *42*(2), 152–173. https://doi.org/10.1111/j.2151-6952.1999.tb01137.x

Peng, J. (2019). How does this exhibition make you feel? Measuring sensory and emotional experience of in-gallery digital technology with GSR devices. *Museums and the Web 2019: Proceedings. Boston*. https://mw19.mwconf.org/paper/how-does-this-exhibition-make-you-feel-measuring-sensory-and-emotional-experience-of-in-gallery-digital-technology-with-gsr-devices/index.html

Schober, M. F., & Spiro, N. (2016). Listeners' and performers' shared understanding of jazz improvisations. *Frontiers in Psychology*, *7*, 1629. https://doi.org/10.3389/fpsyg.2016.01629

Serrell, B. (1998). *Paying attention: Visitors and museum exhibitions*. Washington, DC: American Association of Museums.

Sheng, C. W., & Chen, M. C. (2012). A study of experience expectations of museum visitors. *Tourism Management*, *33*(1), 53–60. https://doi.org/10.1016/j.tourman.2011.01.023

Spiro, N., & Schober, M. F. (2021). Discrepancies and disagreements in classical chamber musicians' characterisations of a performance. *Music & Science*, *4*, https://doi.org/10.1177/20592043211011091

Thomson, L. J., & Chatterjee, H. J. (2022). Heritage, creativity, and wellbeing: Approaches for evaluating the impact of cultural participation using the UCL Museum Wellbeing Measures. In P. Everell & K. Burnell (eds.), *Archaeology, heritage, and wellbeing: Authentic, powerful, and therapeutic engagement with the past*. London: Routledge. https://doi.org/10.4324/9781003182184