That's Me and That's You: Museum visitors' perspective-taking around an embodied interaction data map display

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Abstract: CoCensus, a museum exhibit leveraging embodied interaction, allows users to collaboratively explore US census data on a large GIS display. We utilize tracking technologies to support personalized interactions, and we examine users' perspective-taking when discussing and interpreting the data display. Here pronoun use is analyzed to examine how the affordances of this technology facilitate connections between visitors and the social worlds represented by the data.

Introduction and Background

History museums strive to connect visitors' culturally situated "little narratives" to social and historical "big narratives" (Rowe, Wertsch, & Kosyaeva 2002). With CoCensus (Roberts, Radinsky, Lyons, & Cafaro, 2012), users pick an ancestry category, then approach an exhibit carrying a passive RFID tag which reveals their ancestry dataset on a large, interactive, shared display (Cafaro, Panella, Lyons, Roberts, & Radinsky, 2013). This paper explores one facet of narrative creation – positioning – during the collaborative exploration of the interactive map. We hypothesized that this design would encourage users' *actor* positioning (Brunyé, Ditman, Mahoney, Augustyn, & Taylor, 2009), demonstrated by visitors' use of first-person pronouns when referring to the mapped data. We use Brunyé and colleagues' (2009) framework for examining the perspectives taken by readers in their mental simulations of a narrative: readers take an *actor perspective* when they position themselves as participants in the scene, associated with the use of first-person pronouns (e.g. "I," "we"). An *onlooker perspective* is marked by third-person pronouns (e.g. "he," "they"). We assert that visitors' usage of personal pronouns can similarly elucidate the immersive depth and degree of embodiment in the narratives visitors construct with an interactive museum exhibit.

Methods and Analysis

While interacting, participants were asked questions about their interpretations, including "What do you see in this display?" and "Does anything you see in the display surprise you?" Responses were transcribed and coded to characterize the referents of speech. Transcripts were coded as evidencing an "actor" or "onlooker" perspective based on pronoun usage, in order to track the perspectives adopted by each visitor in their shared narratives constructed during the interview. A third code, "self," was used to document instances of visitors referring to themselves outside the context of the map, e.g. "I'm German." By contrast, a "data" code was used when visitors referred to the data on the map absent any personal connection (Figure 1).

We also tracked the ways each group utilized the space in the exhibit. Moving forward and backward affected the layering and transparency of the data shown on the shared screen. The further a user stood from the display, the more transparent her/his data were, and whoever was closest to the display saw her/his data "on top." A log file recorded the movements of each user in the space. Traces of visitors' locations during these three interviews are shown in Figure 1. Darker traces correspond to the locations were the user spent more time.

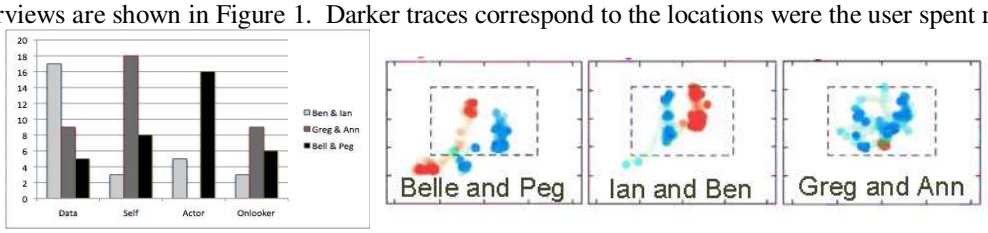

Figure 1. Frequency of perspectives (left) and traces of interaction patterns (right). The first listed participant in each pair is represented by red.

Findings

The three groups talked about the display in different ways, revealing different modes of interaction afforded by the exhibit. Belle and Peg assumed "actor" perspectives, e.g. "It looks like I'm along the Lake" (Belle), "And I'm not" (Peg). Sixteen of the 35 codes applied to their transcript were actor codes. This actor positioning was coincident with their movements in the space (Figure 2), suggesting that interaction may promote connections to the data.

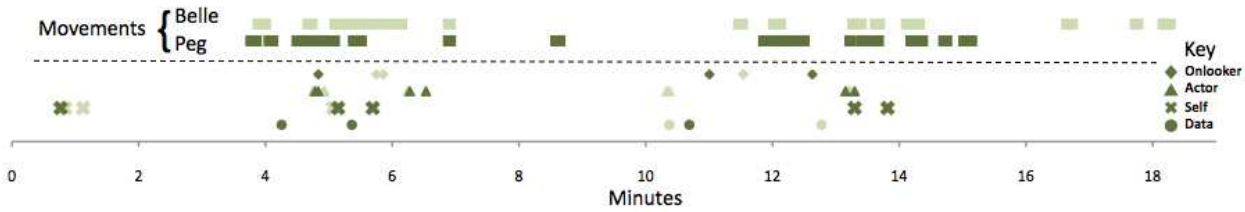

Figure 2. Timeline of Belle and Peg's movements in the exhibit space alongside pronoun usage.

By contrast, Greg and Ann did not assume the actor perspective. They talked about themselves and each other, including references to ancestry, but did not reference the mapped data as connected to themselves. Of all the visitors, Ann moved the most in the interaction space, seeming to be very engaged with the interactivity of the system. While she realized that she was able to control the data transparency, she frequently walked from left to right, despite the fact that side-to-side movement produces no effect on the display. Greg, in contrast, stood virtually still during the entire discussion. Their lack of understanding of the interaction design may have ultimately prevented them from engaging more personally with the data.

In between these two cases is the father-son pair Ben and Ian. The majority of the 28 codes applied to their interview were references to the data on the display, without reference to the people those data represent. They sometimes assumed the actor perspective, such as when Ian interpreted for his father, saying, "That's you, okay, see? The dark spots are where you and me are in the same place," but they minimally discussed personal stories, only adopting "self" and "onlooker" perspectives three times each. Instead, the majority of the interview was spent trying to make sense of the display. Ben and Ian were able to utilize the interactivity to "see" each other's data; that is, they were able to "instrumentally operate" the system (Williams, Kabisch, and Dourish, 2005). Ian moved forward and backwards, illustrating to his father which data were "him." Ben took longer to figure out how to interact with the system, looking for what he called "the optimal distance" from the screen, but eventually asked Ian to move in order to both see his "own" data on top and to explore their overlapping areas. It was only at that point that Ben switched to the "actor perspective" and embodied "his" data, but he still only did so for one turn.

Discussion

These three cases show different examples of how embodied interaction appeared to foster adoption of an actor perspective. When these museum visitors recognized their ability to instrumentally operate the system, they established a more direct and personal connection with the data they were controlling. The interaction design allowed visitors to explore the represented world "as embodied actors" (Dourish, 2001). This may afford the construction and sharing of personal narratives that incorporate data representations.

References

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Acknowledgements

This work is funded by the National Science Foundation and the National Endowment for the Humanities.

Census data courtesy of Minnesota Population Center. *National Historical Geographic Information System*, www.nhgis.org.