

Investigating the Climate Perception Gap

Through Interactive Design

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Abstract

Sitara Systems designs interactive systems for cultural institutions. This report documents a year-long study, conducted with the Yale Peabody Museum and the Yale Program on Climate Change Communication, that asked a narrow question: when a museum audience already cares about climate change but underestimates how much everyone around them cares, does correcting that misperception change what visitors do next? We built a walk-up touchscreen exhibit that measured each visitor's own concern, measured what they assumed their community felt, and then invited them to act by scanning a QR code linking to local climate organizations. In the first phase of the study (962 completed sessions between January and August 2025), we held all exhibit content constant and varied only the order in which visitors encountered a display of aggregated community sentiment. Visitors were strongly concerned about climate change—81% registered as Alarmed or Concerned, against 54% nationally—yet 58% believed that fewer than half of their neighbors shared that concern. Reported willingness to act did not differ between the two orderings. Observed behavior did: visitors who saw the community's aggregated concern earlier, before being asked to act, scanned the QR code more than 2.5 times as often as those who saw the same information later ($\chi^2, p = 0.0003$). We report the design, the Phase 1 findings, the confound that keeps them from being conclusive, and the control condition now running in Phase 2.

1 Background

A recurring challenge for museums and other public-education institutions is helping visitors see their own social context accurately. This matters most for issues where individual actions, small on their own, accumulate into meaningful change only when enough people take them. Climate change is one such issue, and it carries a specific obstacle: people consistently underestimate how much concern about it their fellow citizens share.

The scientific picture is not in doubt. More than 99% of climate scientists agree that recent warming is caused by human activity (Lynas, Houlton, and Perry), and as of late 2023 a majority of Americans—57%—registered as either Alarmed or Concerned about global warming (Leiserowitz et al.). Yet Americans believe that only 37 to 43% of their peers support climate mitigation policy, roughly half the true figure (Sparkman, Geiger, and Weber). The name for this pattern—privately holding a view while wrongly assuming most others reject it—is *pluralistic ignorance* (Miller and

McFarland; Prentice and Miller).

The consequence is a kind of social inertia. People have access to information about climate change, but conviction alone does not reliably produce action when a person believes they are in the minority. Acting can feel socially risky, even pointless, if no one else appears to be moving.

If we close the perception gap, will people be more likely to act?

This report investigates the scale of that perception gap in one museum setting, and whether an interactive exhibit can narrow it in a way that changes behavior. The exhibit is installed at the Yale Peabody Museum in New Haven, Connecticut. Its survey component is built on the Six Americas Super Short Survey (SASSY), a validated four-question segmentation instrument developed by the Yale Program on Climate Change Communication (Chryst et al.), extended with two questions of our own: one measuring the perception gap directly, and one measuring willingness to act. After answering, a visitor can see how their own responses sit against those of the surrounding community. That structure lets us test how the presence and timing of community data affect a visitor's likelihood of taking a concrete next step.

2 The exhibit and the survey

The exhibit opens with paleoclimate context. It presents the long-run cycle of icehouse and greenhouse states and then focuses on the Paleocene–Eocene Thermal Maximum (PETM), the warming event climate scientists treat as the closest natural analog to industrial-era warming—while making clear that the modern change is happening roughly an order of magnitude faster (Fig. 1).

From that context, the visitor moves to present-day New Haven, exploring a map of where the city's natural and built environments face the greatest stress under extreme heat and extreme storms, alongside the measures already being taken to adapt (Fig. 2).

The survey follows. Its first four questions replicate the SASSY for audience segmentation:

1. How important is the issue of global warming¹ to you personally?
2. How worried are you about global warming?
3. How much do you think global warming will harm you personally?
4. How much do you think global warming will harm future generations of people?

After the SASSY, we add a short modular sequence. One question **measures the perception gap**, asking each visitor to estimate how much of the local community is worried about climate change:

¹The Yale Program on Climate Change Communication uses the vernacular term “global warming” rather than the scientific-consensus term “climate change.” We retained “global warming” in the survey wording to maintain continuity with the program's existing instrument and data.

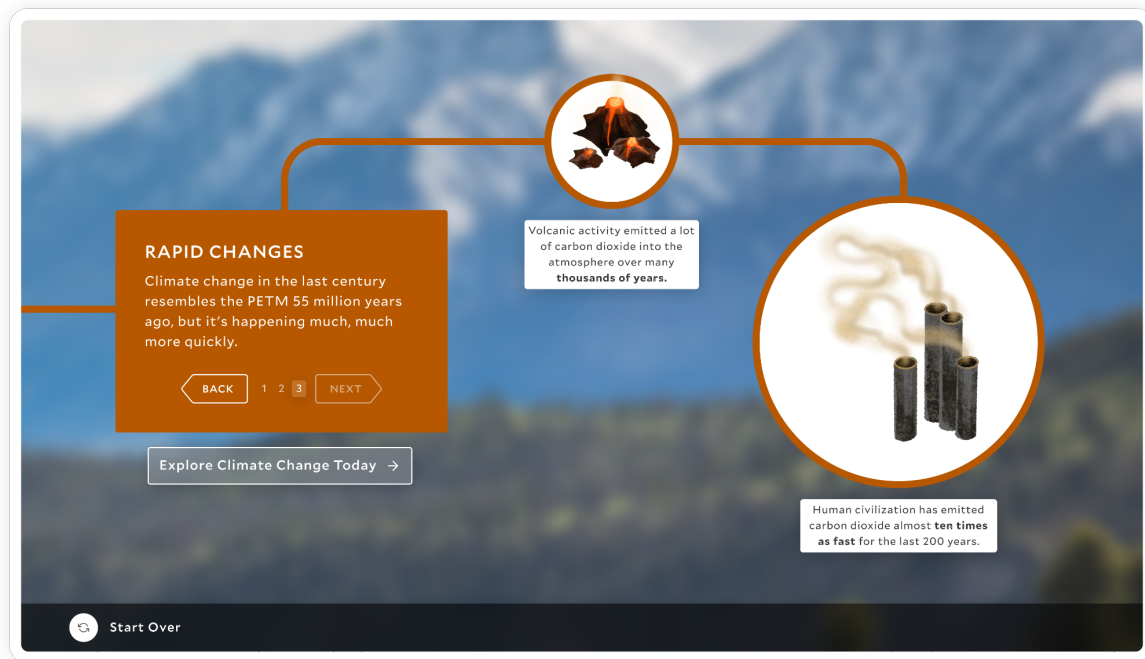


Figure 1. Paleoclimate framing. The exhibit introduces the PETM as a natural analog for present-day warming, emphasizing that the modern change is occurring far faster. Credit: Sitara Systems.

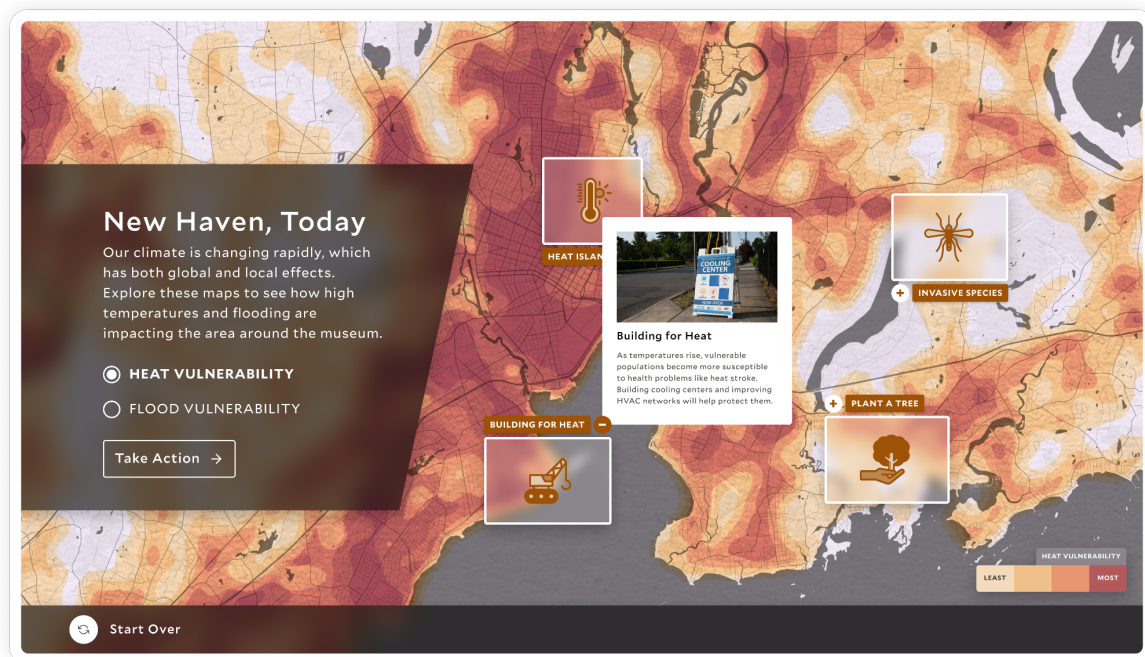


Figure 2. Local framing. Visitors examine heat and flood vulnerability across New Haven, grounding a global issue in the area around the museum. Credit: Sitara Systems.

What percentage of people in our local community do you think are worried about global warming?

A second **measures willingness to act**, asking how likely the visitor would be to join a campaign on the issue:

How willing or unwilling would you be to join a campaign to convince elected officials to take action to reduce global warming?

Between these questions, the exhibit can **reveal the community's aggregated segmentation results** for New Haven County. Individual responses are never shown; the reveal presents the distribution of concern across prior participants, which keeps the display honest about the group while protecting each visitor on a subject some consider politically charged. The arrangement of these components—which we refer to as the **interaction flow**—is what the study varies. The flow alternates by day, running one version on even-numbered days and the other on odd-numbered days.

The experience ends with a **call to action**: QR codes linking to the websites of local climate organizations. Because each survey version tags its QR codes distinctly, our system correlates a scan with the specific flow the visitor experienced. A scan is a small but observable behavior tied to a real-world action, which makes it a more meaningful outcome measure than self-reported intent alone.

3 Phase 1 interaction flows

Phase 1 ran from January 1 to August 10, 2025. Its two flows differed in a single respect: **when the community's concern was revealed relative to the willingness question** (Fig. 3). In Version 1 (even-numbered days), the reveal came before the visitor reported their willingness to act. In Version 2 (odd-numbered days), the visitor reported willingness first, and the reveal came afterward. In both versions the reveal preceded the final call to action, and all other content, wording, and visuals were identical.

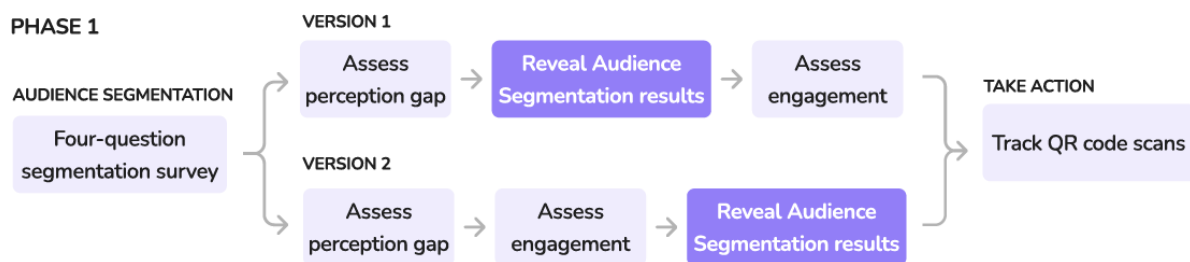


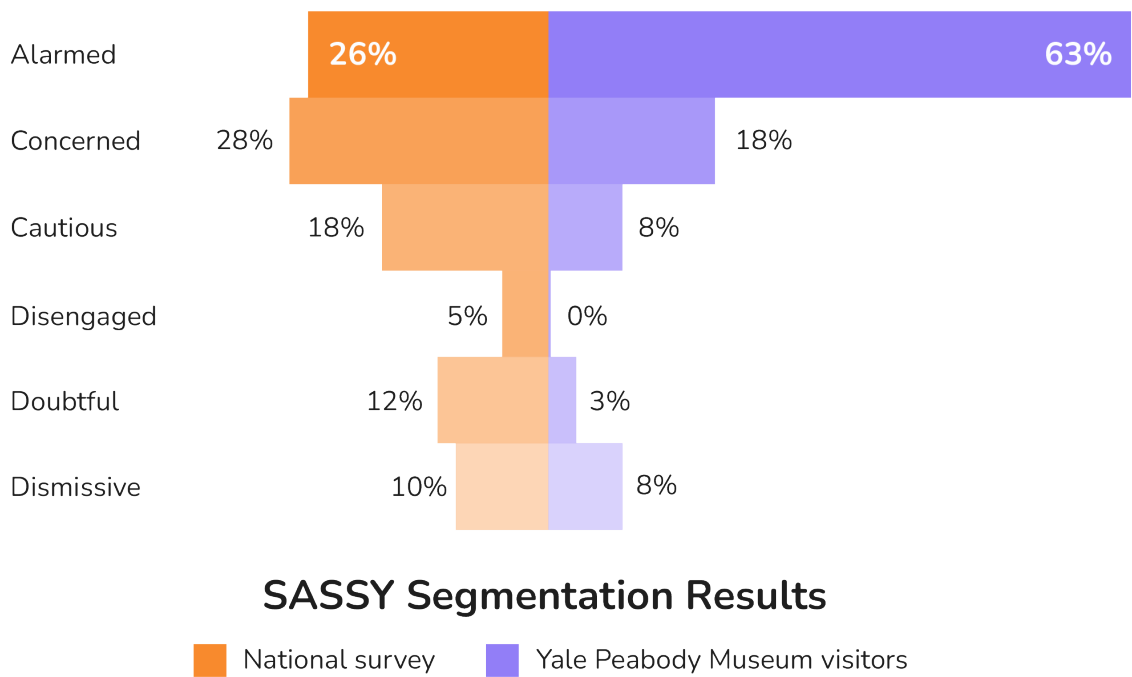
Figure 3. Phase 1 interaction flows. Both versions present identical content and the same call to action; they differ only in whether the community-sentiment reveal falls before or after the willingness question. Credit: Sitara Systems.

4 Phase 1 results

Across Phase 1, 962 visitors completed the survey—519 on the Version 1 flow and 443 on the Version 2 flow.

4.1 The audience was already concerned

Segmentation showed the Yale Peabody audience to be markedly more concerned than the national public. 81% of visitors registered as Alarmed or Concerned, against 54% in the contemporaneous national Six Americas sample (Leiserowitz et al.). Not one of the 962 visitors registered as Disengaged—the segment that has heard little about the issue—compared with 5% nationally (Fig. 4). By the logic that treats persuasion as the goal, this was an audience with little left to be persuaded of.



National data:
Global Warming's Six Americas, December 11-22, 2024, n = 1,013 U.S. adults
Source: Yale Program on Climate Change Communication; George Mason University Center for Climate Change Communication

Figure 4. Audience segmentation, Yale Peabody Museum visitors versus the national Six Americas sample. Visitors skew heavily toward the Alarmed and Concerned segments. National data: Global Warming's Six Americas, December 2024, *n* = 1,013 U.S. adults (Yale Program on Climate Change Communication and George Mason University). Credit: Sitara Systems.

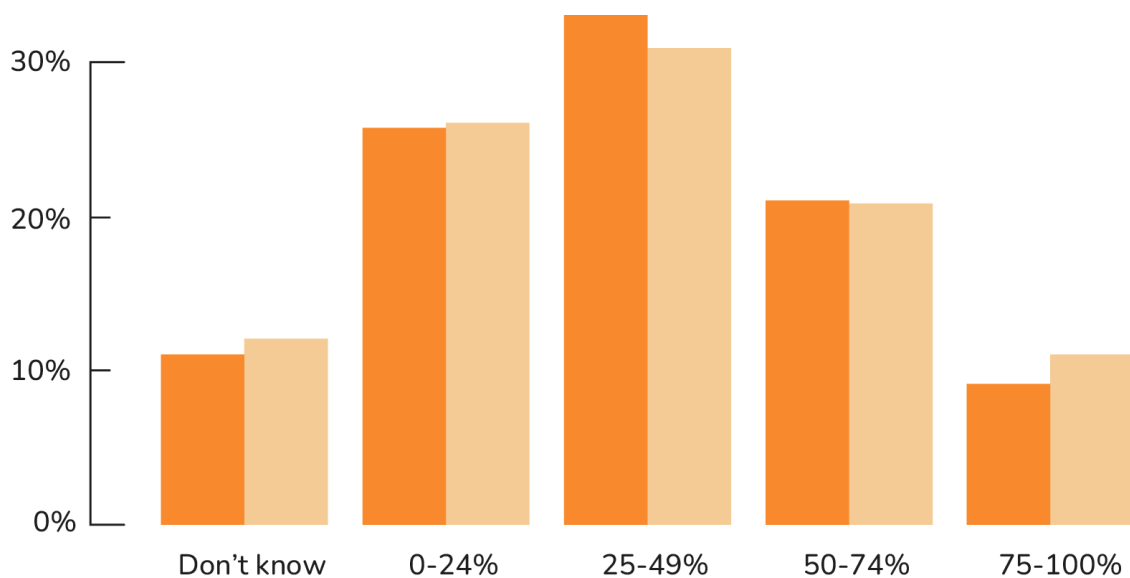
4.2 But the audience did not know it

Despite their own concern, visitors badly underestimated how widely that concern was shared. Asked what share of their local community worries about global warming, 58% of visitors answered below 50%. Only 21% gave an estimate in the 50–74% band that brackets the roughly 60% concern measured for New Haven County generally; fewer still reached the 75–100% band

that would match the 81% measured among visitors themselves (Fig. 5). In other words, a gallery full of concerned people consistently believed itself to be a minority.

What percentage of people in our local community do you think are worried about global warming?

Estimated share of community worried	Version 1	Version 2
75% to 100%	46	49
50% to 74%	110	92
25% to 49%	171	138
Less than 25%	136	113
Don't know	56	51
Total	519	443



What percentage of people in our local community do you think are worried about global warming?

Version 1 Version 2

Figure 5. Visitors' estimates of the share of their community worried about global warming, by flow. The two flows produced nearly identical distributions, both concentrated well below the measured level of local concern. Credit: Sitara Systems.

4.3 Reported willingness did not move

Reported willingness to act was effectively the same across the two flows, whether or not the visitor had yet seen the community reveal. Combining both flows, 9% of visitors were already participating in a campaign to press elected officials on climate action, and about 57% said they definitely or probably would join one (Fig. 6). The distributions for Version 1 and Version 2 were close enough to be treated as equivalent.

How willing or unwilling would you be to join a campaign to convince elected officials to take action to reduce global warming?

Willingness to join a campaign	Version 1	Version 2
I am already participating in a campaign	42	46
I definitely would do it	147	109
I probably would do it	152	136
I probably would not do it	86	66
I definitely would not do it	92	86
Total	519	443

4.4 But behavior did

The behavioral measure told a different story. Although the two flows produced statistically similar reported willingness, they produced a clear difference in observed action. Visitors on Version 1—who saw the community reveal earlier, before reporting their willingness—scanned the provided QR codes more than 2.5 times as often as visitors on Version 2, a difference significant by a chi-square test ($p = 0.0003$; Fig. 7).

5 What we can and cannot conclude

The Phase 1 result is suggestive but not yet conclusive, and the reason is built into the design. Both Version 1 and Version 2 revealed the community's concern at some point before the call to action; they differed only in when. So the study clearly demonstrates that the *timing* of the reveal changes behavior—moving it earlier, before the willingness question, more than doubled the scan rate—but it does not isolate the effect of the reveal itself against no reveal at all. We also find it notable that behavior shifted while self-reported willingness did not, which suggests the reveal acts on something other than stated intent. Separating the effect of *whether* the community is made visible from the effect of *when* is the question Phase 2 is built to answer.

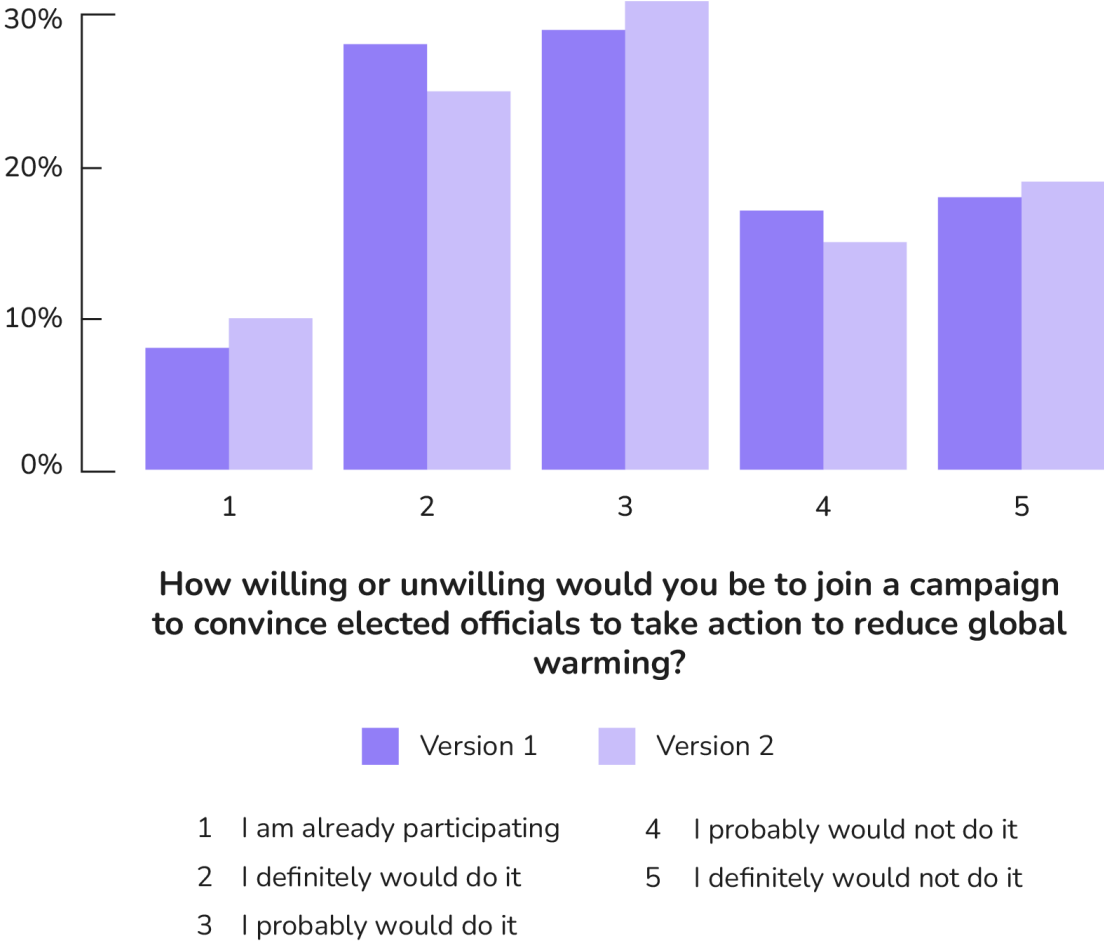


Figure 6. Reported willingness to join a climate campaign, by flow. Self-reported willingness was statistically indistinguishable between the two flows. Credit: Sitara Systems.



Figure 7. Observed QR-code scan rate by flow. Visitors who encountered the community reveal earlier scanned more than 2.5 times as often as those who encountered the same information later, despite reporting similar willingness to act. Credit: Sitara Systems.

6 Phase 2: isolating the reveal

Beginning August 12, 2025, we started a second phase designed to supply the missing control (Fig. 8). The Version 2 flow from Phase 1—reveal after the willingness question—is retained. The new Version 1 removes the community reveal entirely, so that one group of visitors is never shown how their neighbors feel at any point in the experience. That group gives us a genuine baseline: respondents who are not informed of the perception gap at all, against which the effect of revealing it can be measured directly.

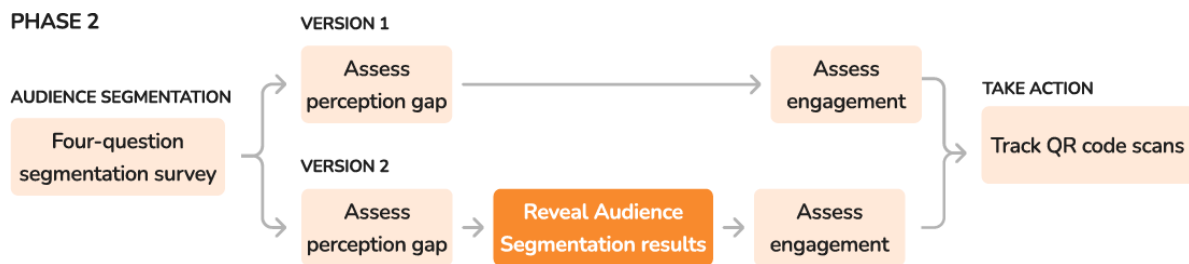


Figure 8. Phase 2 interaction flows. The retained Version 2 reveals community concern before the willingness question; the new Version 1 omits the reveal entirely, providing a no-reveal control. Credit: Sitara Systems.

7 Contribution and implications

This study evaluates whether addressing the perception gap changes what visitors do in an exhibit built around a complex social issue. The Phase 1 evidence is specific and, so far, encouraging: with content held constant, the timing of a truthful display of community concern more than doubled a real behavioral outcome, even though it left self-reported attitudes untouched. That points to a design lever distinct from persuasion—one that works by making an audience’s existing alignment visible to itself at the moment a decision is being made.

We are cautious about the limits. This is one exhibit, on one issue, in one institution whose visitors already skew toward concern, and a QR scan is a first step toward action rather than action itself. Phase 2 will tell us whether the reveal matters on its own or only through its timing. If the effect holds, the practical contribution is a set of guidelines for designing interactive surveys and reveals that maximize their effect on what visitors do next—applicable not only to climate communication but to any setting where making shared concern visible could help individual conviction translate into collective action.

Acknowledgements

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References

- Chryst, Breanne, et al. "Global Warming's 'Six Americas Short Survey': Audience Segmentation of Climate Change Views Using a Four-Question Instrument." *Environmental Communication*, vol. 12, no. 8, 2018, pp. 1109–1122. <https://doi.org/10.1080/17524032.2018.1508047>
- Leiserowitz, Anthony, et al. *Global Warming's Six Americas*. Yale Program on Climate Change Communication and George Mason University Center for Climate Change Communication, 2023–2024. <https://climatecommunication.yale.edu/about/projects/global-warmings-six-americas/>
- Lynas, Mark, Benjamin Z. Houlton, and Simon Perry. "Greater than 99% Consensus on Human Caused Climate Change in the Peer-Reviewed Scientific Literature." *Environmental Research Letters*, vol. 16, no. 11, 2021, 114005. <https://doi.org/10.1088/1748-9326/ac2966>
- Miller, Dale T., and Cathy McFarland. "Pluralistic Ignorance: When Similarity Is Interpreted as Dissimilarity." *Journal of Personality and Social Psychology*, vol. 53, no. 2, 1987, pp. 298–305. <https://doi.org/10.1037/0022-3514.53.2.298>
- Prentice, Deborah A., and Dale T. Miller. "Pluralistic Ignorance and Alcohol Use on Campus: Some Consequences of Misperceiving the Social Norm." *Journal of Personality and Social Psychology*, vol. 64, no. 2, 1993, pp. 243–256. <https://doi.org/10.1037/0022-3514.64.2.243>
- Sparkman, Gregg, Nathan Geiger, and Elke U. Weber. "Americans Experience a False Social Reality by Underestimating Popular Climate Policy Support by Nearly Half." *Nature Communications*, vol. 13, 4779, 2022. <https://doi.org/10.1038/s41467-022-32412-y>
- Yale Program on Climate Change Communication. "Six Americas Super Short Survey (SASSY)." <https://climatecommunication.yale.edu/visualizations-data/sassy/>