

Social Legibility in Experiential Design: Perception Gaps, Shared Space, and Collective Action

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Abstract

Experiential graphic design operates in shared, public environments where meaning is shaped not only by content but by co-presence: visitors encounter information while observing, and being observed by, other people. In social-impact contexts, this shared condition creates a design challenge that individual media never faces. Even when visitors are strongly aligned in their beliefs, uncertainty about what *others* think can suppress action. This paper introduces **social legibility** - the degree to which an environment makes collective belief and readiness to act perceptible to its participants - as a distinct design consideration for experiential design. Drawing on the social psychology of pluralistic ignorance and norm misperception, we argue that in the context of social impact projects, hesitation to act in shared space is often a failure of social legibility rather than a failure of motivation or understanding. We ground this framework in a year-long design research study conducted with the Yale Peabody Museum and the Yale Program on Climate Change Communication, in which an interactive climate exhibit held content constant while varying only *when* aggregated visitor sentiment became visible. Visitors shown evidence of shared concern before an invitation to act were more than 2.5 times as likely to take that action — without any change in reported attitudes. We close with practical design strategies and implications for practice, evaluation, and pedagogy.

1 Concern Without Action

Every experiential designer who works on social-impact projects has stood at the back of a gallery and asked some version of the same question. The exhibit is well crafted. The interpretive content is accurate and affecting. Exit surveys confirm that visitors care about the issue. And yet the action the experience was built to support — signing up, showing up, joining, giving — remains stubbornly rare. If so many people agree, why don't they act?

The field's default answer is that the experience did not persuade the audience enough. If visitors are not acting, we assume they must not care enough, understand enough, or feel enough — and so the next design iteration reaches for stronger storytelling, more immersion, more emotional resonance. This diagnosis is rarely stated outright, but it is embedded in how social-impact projects are briefed, funded, and evaluated.

Impact is measured in attitudes shifted and minds changed.

This paper argues that in a large class of social-impact contexts — those that depend on *collective* action — failure to persuade is frequently the wrong diagnosis. Research in social psychology shows that action is driven not only by what individuals believe, but by what they believe *others* believe: their second-order beliefs. When people underestimate how widely their own concern is shared, a perception gap opens up, and acting starts to feel socially risky even for people whose personal conviction is high. Under those conditions, an experience can affirm every individual visitor's beliefs and still leave the room collectively frozen.

Experiential design is uniquely implicated in this dynamic, and uniquely positioned to address it. Unlike a book, a documentary, or a social feed, an exhibition is encountered in shared physical space, among strangers, in real time. The environment does not just deliver content; it determines what each visitor can perceive about everyone else. Whether individual responses remain private or become visible as a collective pattern is a design decision — made through choices about interaction, sequencing, aggregation, and display that experiential designers already control.

This reframing carries an implication that should be stated plainly at the outset, because everything else in this paper follows from it: **in shared space, there is no neutral design.** Designers and the institutions they serve often hesitate to make collective sentiment visible, worried that doing so will bias the crowd — that once visitor beliefs are shown publicly, people will defer to the apparent majority rather than risk being in the minority, so their responses will no longer be their own. The worry is understandable, but it rests on a misunderstanding worth naming. Social psychology shows that any environment which makes social norms perceptible shapes what people infer about the group: a shared space cannot decline to convey a norm, only choose whether the norm it conveys is accurate. The closest thing to neutrality is therefore not an environment that withholds social information in the hope of leaving individual responses uninfluenced — that environment still conveys a norm, merely a distorted one — but one that presents an honest representation of the room's actual beliefs. The research presented here suggests that the scale is never unweighted. Because people systematically misread quiet rooms — interpreting the absence of visible response as the absence of concern — an environment that keeps its audience's alignment invisible does not decline to take a position. It delivers one: a false verdict of indifference, rendered by default and mistaken for fact. In social-impact contexts, the choice not to design for the social layer is itself a design decision with measurable behavioral consequences.

We propose **social legibility** as the name for this consideration: the degree to which an environment makes collective belief, readiness, and alignment perceptible to the people within it. The sections that follow help to ground the concept in social science, identify the specific design decisions through which environments shape second-order beliefs, and present a year-long empirical case study in which a single change in social legibility — revealing shared concern before rather than after an invitation to act — increased visitor participation more than 2.5-fold without changing a single mind.

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2 Pluralistic Ignorance and Second-Order Beliefs

The social science underlying this argument begins with a simple asymmetry: belief is private, but action is public. A visitor knows with certainty what they themselves think about climate change, gun violence, or the future of their community. What everyone around them thinks, they can only infer — from what others say, what others do, and, most often, from others' silence.

Social psychologists call the predictable failure of this inference *pluralistic ignorance*: a situation in which members of a group privately hold or reject a belief while assuming, incorrectly, that most others feel differently (Miller and McFarland). The canonical demonstration in the research literature is a study of college drinking: students privately uncomfortable with campus drinking culture assume their peers are entirely at ease with it, and adjust their own behavior toward a norm almost no one actually holds (Prentice and Miller). The same dynamic is easy to recognize elsewhere once it is named. Students sit through a confusing lecture without raising their hands, each reading the stillness of the others as comprehension rather than shared confusion; neighbors who each quietly support a local climate measure say nothing at the community meeting, mistaking the silence around them for indifference rather than shared reticence. In each case, people read the *absence* of visible action as evidence about others' inner states — and, most importantly, read it *incorrectly*.

Two further concepts sharpen the picture. Norms research distinguishes what others actually do and believe (descriptive norms) from what others approve of (injunctive norms), and shows that behavior shifts toward whichever norm is made visible in the environment (Cialdini, Reno, and Kallgren). And the Yale Program on Climate Change Communication has documented a *spiral of silence* in exactly this domain: because people underestimate how many others share their concern, they hold back from voicing it — most who care about the issue say they rarely or never discuss it — which removes the very signal that would correct the misperception, so the silence sustains itself (Maibach et al., *Is There a Climate "Spiral of Silence"*). The misreading becomes self-reinforcing, as each person's hesitation is taken by others as further evidence that concern is rare.

Designers should notice what kind of failure this is. It is not a failure of information about the *issue* — the students understood the lecture's subject well enough to know they were confused, and the campus drinkers held clear private views. It is a failure of information about the *audience*. Every person in these settings was making a design-relevant inference from the built and social environment: reading a quiet room, an orderly queue, a gallery of composed faces. The environment supplied abundant cues about the issue and almost none about the people, and the people filled that void with a systematically wrong guess. Pluralistic ignorance is, in this sense, an environmental condition before it is a psychological one — which is exactly why it should interest a discipline that designs environments.

Climate change offers the best-documented case of this dynamic at national scale. Longitudinal survey research finds that a large majority of Americans believe global warming is happening and report being worried about it (Leiserowitz et al.; Maibach et al., *Global Warming's Six Americas*). Yet Americans systematically underestimate how many of their fellow citizens share that concern — by nearly half. Sparkman, Geiger, and Weber call this a *false social reality*: 80–90% of Americans underestimate national climate concern and support for major climate policies, perceiving a country nearly opposite to the one that actually exists. Supporters of climate policy outnumber opponents roughly two to one, while most Americans be-

lieve the reverse. Similar perception gaps have been measured across many contested social issues (Yudkin, Hawkins, and Dixon).

For designers, the practical finding that falls out of this literature is compact: **action requires both attitude and assurance**. Attitude is what an individual believes and feels about the issue. Assurance is their confidence that others share the belief and are ready to act alongside them. Most social-impact design invests exclusively in attitude — in persuading, moving, and educating the individual. But in domains where attitudes are already widely aligned, attitude is not the limiting factor: assurance is. And assurance, unlike attitude, is a property of what the shared environment makes visible.

3 Defining Social Legibility

The concept of legibility — how readily something can be perceived and correctly understood — already runs through disparate fields, in two related senses. The first is clarity: experiential graphic designers evaluate typographic legibility — can this be read at distance, at speed, by aging eyes? — and the spatial legibility of a place, or whether a person can form a coherent mental image of it and navigate with confidence (Lynch). The second sense is sharper, and it is the one social legibility extends: making hidden information observable. The political scientist James C. Scott describes how states labor to render an opaque population legible — countable, mappable, governable — so that what was invisible to authority becomes perceptible (Scott). In human-robot interaction, Dragan, Lee, and Srinivasa call a robot's motion legible when it visibly telegraphs the robot's otherwise-hidden intent, letting a person read purpose from movement (Dragan, Lee, and Srinivasa). Across these cases, legibility is the degree to which an environment or agent lets an observer perceive a true state that would otherwise stay latent.

This paper proposes extending the term to the social layer of shared space. **Social legibility is the degree to which an environment makes collective belief, readiness, and alignment perceptible to the people within it.** A socially legible environment allows a visitor to answer, with reasonable accuracy, the questions that govern collective action: Do the people around me care about this? Would they act? Am I alone here, or am I one of many? A socially illegible environment leaves those questions to inference — and, as the previous section established, unaided inference in quiet public space reliably fails in one direction: toward underestimating shared concern.

Framed this way, social legibility is a property that every shared environment already has implicitly, whether or not anyone designed it. A gallery in which deeply concerned visitors pass through in silence is socially *illegible*: each visitor experiences the issue alone even though they are in a crowd. A pledge wall overflowing with handwritten notes is socially *legible*. The design question is not whether to have social legibility at all, but whether to take responsibility for its presence or lack thereof.

“The design question is not whether to have social legibility but whether to take responsibility for it.”

This is where the field's instinct toward neutrality can be misleading. The cultural sector has spent a decade arguing that institutions cannot stand outside the issues they present — that museums are not neutral

(Autry and Murawski). Social legibility extends that argument down to the scale of interaction design, and adds an empirical mechanism: an illegible room is not a neutral room; it is a room that states loudly, clearly, and *falsely*, that no one cares. The designer who avoids making shared sentiments legible has not avoided influence — they have instead ceded it to a known and named perceptual bias. Honest aggregation, by contrast, does not place a thumb on the scale — it instead removes one that was already there. Practitioners and institutions wary of advocacy should find in this an unexpected comfort: making the room's true state perceptible is not editorializing. It is in fact closer to neutrality than the silence it replaces.

“an illegible room is not a neutral room; it is a room that states loudly, clearly, and *falsely*, that no one cares.”

4 Design Strategies for Social Legibility

Experiential design does what no other designed medium does, because it is the only one that puts people in the same place at the same time. An exhibit can therefore show a visitor — not just tell them — that the strangers around them already share their concern. If social legibility is a property of environments, then it is shaped by ordinary design decisions — most of which are already being made on every project, usually without social legibility in mind. Treating social legibility as a deliberate design factor means treating a few of those decisions as chances to shape it. Here we enumerate four opportunities for designers to either make collective sentiment perceptible or keep it hidden.

Visibility: does private response become public? Many interactive exhibits invite reflection — a poll, a prompt, a pledge — then keep each response private or discard it when the session resets. The exhibit collects exactly the information that could correct the room's perception gap - but often doesn't use it. The first decision is whether individual responses are made visible in the shared environment at all. Existing design patterns do this well — a comment wall, a pledge board, a transparent ballot box that fills over time — each turning private sentiment into a visible, lasting record. Digital interactives often *reduce* social legibility by making responses invisible until the activity is in-progress or completed, as we will see later.

Aggregation: are responses shown individually or as a collective state? A wall of individual notes reads differently than a single figure showing that 81% of recent visitors reported concern. Individual responses are vivid but easily dismissed as biased and unrepresentative; an aggregate statistic makes a claim about the group (Cialdini, Reno, and Kallgren). Aggregation is therefore a representational decision, not a technical one: a distribution can make widely shared concern visible while protecting individual privacy, especially when the topic is sensitive and the setting is public. How the aggregate is presented matters as well, since the same data can be shown to emphasize disagreement or to reveal a shared majority.

Timing: when does collective information appear relative to the moment of action? Social information revealed after an experience ends may reassure, but it comes too late to inform the action the experience asked for. The same information shown at the decision point changes the social context in which the decision is made. Many exhibits follow a narrative arc that ends in a call to action and only afterward, if at all, report participation — treating the revealed collective state as a conclusion to the experience instead of as

necessary context. For prompting coordinated action, that order should be reversed.

Framing: is the visitor addressed as an individual or as a member of a collective? Interaction design can present an experience as a private exercise (“What do you think?”) or place each response within a group (“Here is where you stand among 1,000 neighbors”). The same content, framed differently, changes whether a visitor reads their concern as unusual or typical. Spatial design contributes as well: an isolated single-user kiosk frames responding as a private act, while shared tables, side-by-side stations, and displays visible across the room frame it as a public one.

None of these decisions requires new technology, larger budgets, or different content. Each concerns what a system does with the responses it already collects, and when it reveals what it knows. This is what makes social legibility a matter of *design* rather than messaging: it is set by interaction structure, spatial sequence, and information display — the core concerns of experiential graphic design.

One ethical boundary belongs alongside these decisions. Social legibility is a strategy of *revelation*, not manufacture: its entire warrant depends on showing visitors a true collective state they could not otherwise perceive. Displaying inflated, invented, or selectively curated “alignment” is not social legibility but manipulation, and it forfeits the trust that public institutions depend on. The designer’s obligation is to make the room honestly legible — including when the honest answer is that alignment is not yet there.

5 Case Study: Making Concern Visible at the Yale Peabody Museum

To test whether social legibility has measurable behavioral consequences, we conducted a year-long design research study in collaboration with the Yale Peabody Museum and the Yale Program on Climate Change Communication. We designed a walk-up touchscreen kiosk about climate change situated in the museum’s public galleries and engaged over 1,250 visitors over the course of the year.

The kiosk presented visitors with three tasks: report their own level of concern about climate change using 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.); estimate how concerned they believed other visitors were — their second-order beliefs; and respond to an invitation to act, in the form of a QR code linking to local community groups organizing climate action. Each of these tasks served a specific methodological purpose. Lightweight survey items kept the interaction under a few minutes, appropriate to gallery dwell times. Asking visitors to *estimate their peers* before seeing any data captured the room’s perception gap directly rather than assuming it. And the QR code provided a small but observable behavioral measure connected to a real-world action, rather than a self-reported intention.

Individual responses were never displayed. The aggregate view presented the distribution of concern across prior participants — a collective state, not a gallery of individual statements. This protected visitors on a topic some consider politically charged, while making the majority unmistakable.

The experimental design isolated a single variable: timing. Across the study, the narrative content, visual design, question wording, and available actions were held constant. The only variable was *when* aggregated audience sentiment — a display showing the distribution of concern reported by prior visitors — became visible. In one user flow, visitors saw evidence of shared local concern before the invitation to act; in the alternate flow, the same aggregate display appeared only after the QR code moment, leaving visitors with

no additional social context at the decision point (fig. 1).

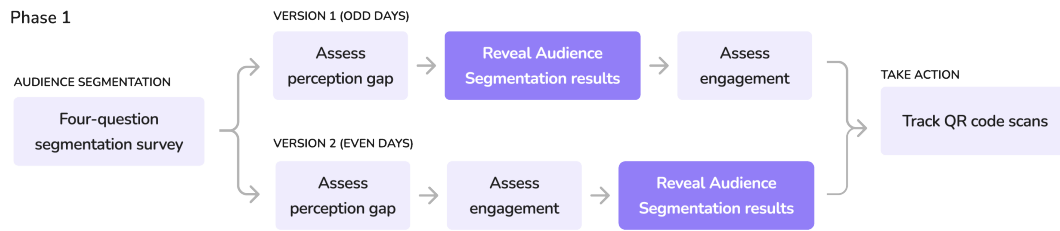


Figure 1. User flows for the two exhibit conditions. Both present identical content, prompts, and actions; only the timing of the aggregated community sentiment display differs. Credit: Sitara Systems.

Three findings are of particular relevance to designers.

First, the audience was already aligned. More than 80% of visitors registered as Alarmed or Concerned about climate change. By the logic of persuasion-first design, this audience required little persuasion (fig. 2).

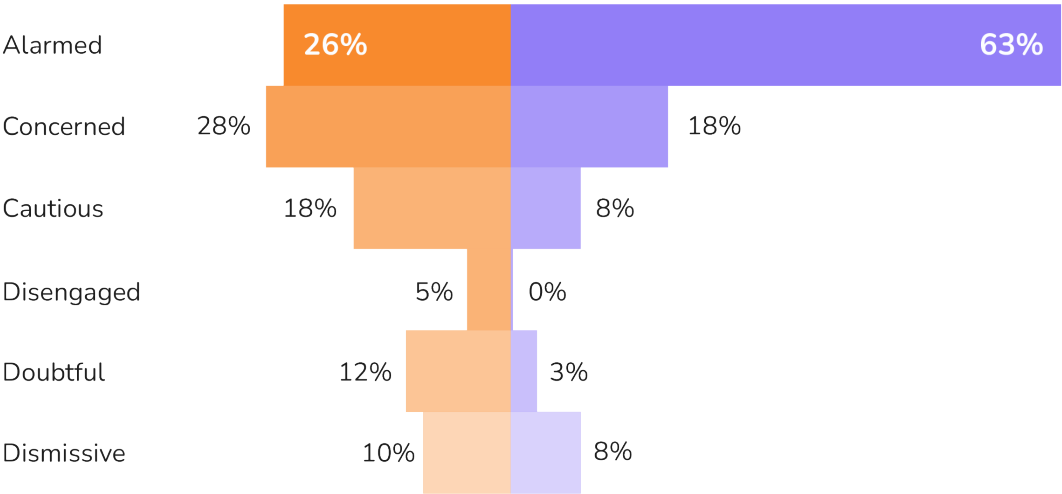
Second, the audience did not know it was aligned. A majority of visitors believed that fewer than half of their peers shared their concern — a perception gap of more than thirty percentage points, mirroring at museum scale the false social reality documented in national survey research (fig. 3). The museum was full of aligned visitors who believed themselves to be outnumbered on this issue.

Third, closing the gap at the right moment changed behavior without changing attitudes. Across both user flows, visitors reported statistically similar concern and willingness to engage — the two versions were equally “persuasive.” But visitors who saw the aggregated evidence of shared concern *before* the invitation to act were more than 2.5 times as likely to scan the QR code than visitors shown the identical information afterward (fig. 4).

The exhibit did not introduce new arguments, new emotional framing, or a new call to action between conditions. It did not increase motivation; the interpretive content in both flows was identical, and self-reported attitudes confirm that neither version changed minds. The only thing the successful version did was make alignment that already existed perceptible at the moment it mattered. Assurance, not attitude, was the active ingredient.

For a field that funds and evaluates social-impact work in terms of persuasion, the implication is uncomfortable but freeing: some experiences may underperform not because they fail to move people, but because they leave a moved audience invisible to itself.

The study’s limits should be stated plainly. This was one installation, on one issue, in one institution — a natural history museum whose visitors skew toward science-engaged publics, in a community whose underlying alignment on climate is high. The behavioral measure, a QR scan, is a first step toward action rather than action itself. And the mechanism we tested presumes that genuine alignment exists to be revealed; in rooms that are truly divided, making the division legible is a different design problem with different ethics. These boundaries do not weaken the design claim — that structural choices about visibility and timing changed behavior while content held still — but they mark where practitioner judgment, and further research across issues and institutions, must take over. That dependence is the point, not a caveat to it: whether and how to make a room legible to itself depends on what a design aims to achieve and what its makers understand about the audience. Social legibility is a consideration to be weighed, not a rule to

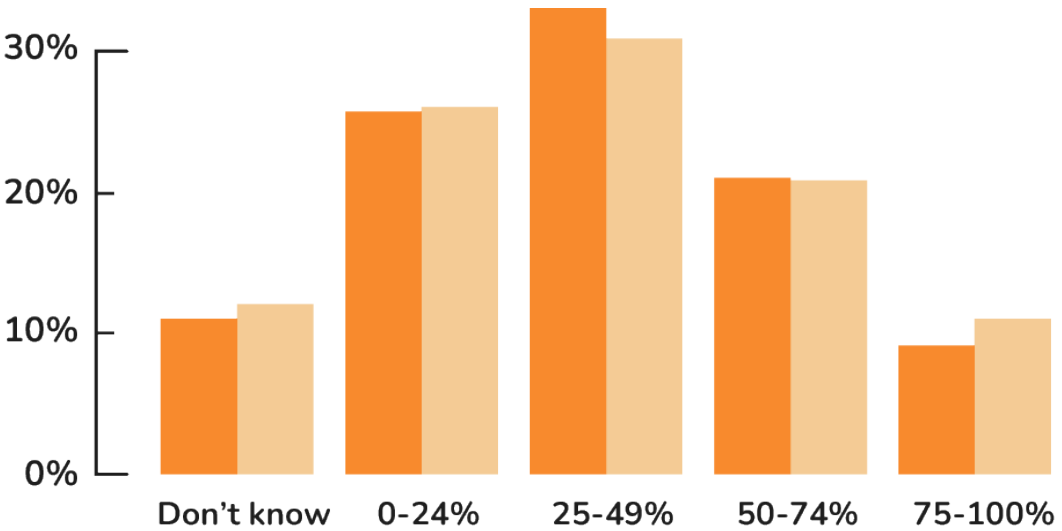


SASSY Segmentation Results

■ National survey ■ Yale Peabody Museum visitors

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 2. Aggregated audience sentiment as displayed in the exhibit: individual responses are translated into a collective distribution rather than identifiable statements. Credit: Sitara Systems.



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

■ Version 1 ■ Version 2

Figure 3. Visitors' estimates of peer concern, compared with measured concern (approximately 81%). A majority of visitors underestimated their community's alignment. Credit: Sitara Systems / Yale Program on Climate Change Communication.

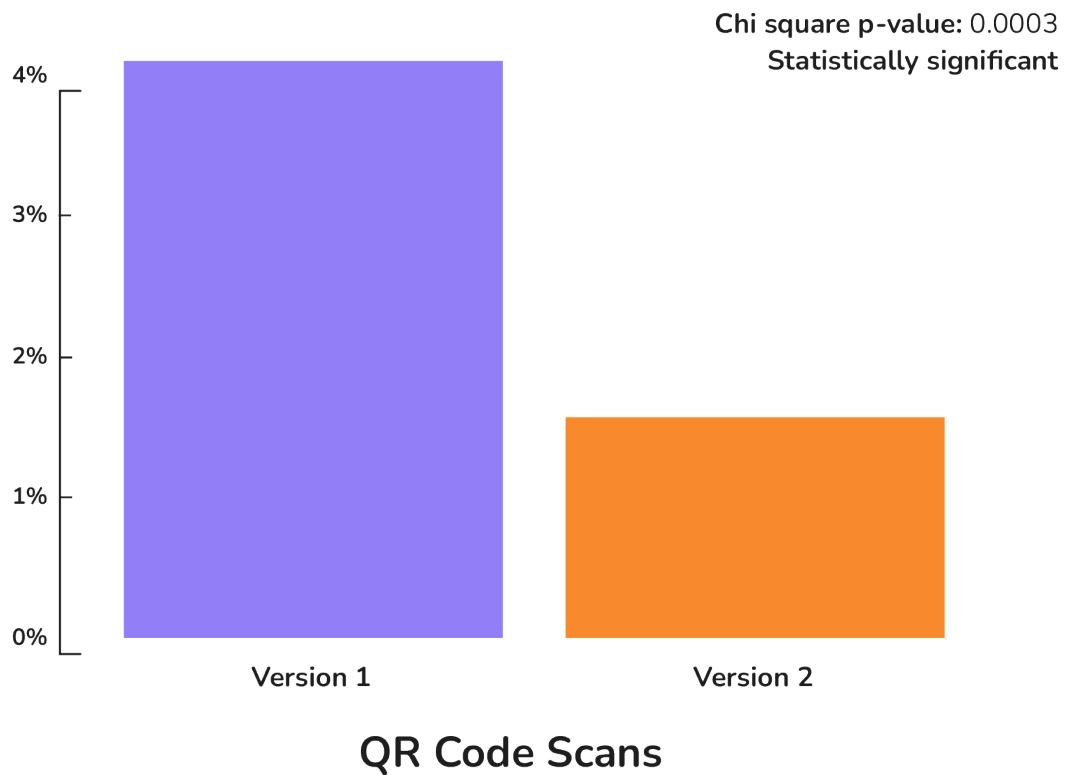


Figure 4. Observed participation by condition. Visitors shown aggregated community sentiment before the call to action were more than 2.5 times as likely to scan the QR code linking to local climate organizations. Credit: Sitara Systems.

be applied.

6 Beyond Climate

Nothing in the mechanism is specific to climate change. Social legibility is relevant wherever action depends on coordination — wherever individuals are willing to act *if* they believe others are willing too. Voting and civic participation, public health behaviors, charitable giving, conservation practices, neighborhood placemaking, and institutional change inside organizations all share the structure: private alignment, public uncertainty, and hesitation that reads as apathy. Any experiential project serving these domains can ask the same three questions our kiosk asked — what does the audience believe, what does it believe about itself, and what would change if it could see itself accurately?

Consider two brief translations. A civic engagement space encouraging residents to attend planning meetings might aggregate and display, at the sign-up moment, how many neighbors from each ward have already committed — converting an intimidating civic act into a visibly shared one. A public health campaign in a transit environment might pair its behavioral ask with live regional participation data rather than celebrity endorsement, on the theory that commuters are less moved by who endorses a behavior than by how many people like them already do it. In both cases the content budget is unchanged; what changes is whether the audience can see itself.

The framework also offers something to evaluators. Social-impact exhibits are typically assessed on attitude change, knowledge gain, and satisfaction — all first-order measures, all individual. Social legibility suggests adding a second-order question to the exit survey: did visitors leave with a more *accurate* picture of others' attitudes than they arrived with? The question costs one survey item, is answerable against baseline data, and — if our study generalizes — may predict downstream behavior better than attitude change does. It also reframes what success means: an exhibit can succeed as communication and still fail as coordination, and only a second-order measure will show the difference.

7 Conclusion

Experiential graphic design has always understood that environments communicate. This paper argues that environments also *reveal* — or fail to reveal — the people within them to one another, and that this second function has been left largely to chance in a field otherwise obsessive about intentionality. Leaving it to chance is not abstention. In collective-action contexts, every shared environment takes a position on whether its audience can see itself; the only question is whether that position was designed.

The contribution of this work is to name that function — social legibility — and to demonstrate, through a controlled year-long deployment, that it has behavioral consequences independent of persuasion: a 2.5-fold difference in visitor action produced by nothing more than the timing of an aggregate display. In collective-action domains where audiences are already aligned, the evidence suggests that the field's persistent gap between attitudes and action is not a persuasion problem. It is a legibility problem, and legibility problems are what this discipline knows how to solve.

The invitation to practitioners is correspondingly concrete. On the next social-impact project, ask not only

what does this experience communicate? but what does it make visible about everyone else in the room? For audiences who care deeply and believe themselves alone, that second question may be the one that determines whether anything happens next.

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Resources

- Autry, La Tanya S., and Mike Murawski. "Museums Are Not Neutral: We Are Stronger Together." *Panorama: Journal of the Association of Historians of American Art*, vol. 5, no. 2, Fall 2019. <https://journalpanorama.org/article/museums-are-not-neutral/>
- 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>
- Cialdini, Robert B., Raymond R. Reno, and Carl A. Kallgren. "A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce Littering in Public Places." *Journal of Personality and Social Psychology*, vol. 58, no. 6, 1990, pp. 1015–1026. <https://doi.org/10.1037/0022-3514.58.6.1015>
- Dragan, Anca D., Kenton C. T. Lee, and Siddhartha S. Srinivasa. "Legibility and Predictability of Robot Motion." *Proceedings of the 8th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 2013, pp. 301–308.
- Leiserowitz, Anthony, et al. *Climate Change in the American Mind: Beliefs and Attitudes*. Yale Program on Climate Change Communication, 2024.
- Lynch, Kevin. *The Image of the City*. MIT Press, 1960.
- Maibach, Edward, et al. *Global Warming's Six Americas*. Yale Project on Climate Change Communication, 2009.
- . *Is There a Climate "Spiral of Silence" in America?* Yale University and George Mason University, 2016.
- 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 Conse-

quences 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>

Scott, James C. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press, 1998.

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, no. 4779, 2022. <https://doi.org/10.1038/s41467-022-32412-y>

Yudkin, Daniel A., Stephen Hawkins, and Tim Dixon. *The Perception Gap: How False Impressions Are Pulling Americans Apart*. More in Common, 2019. <https://doi.org/10.31234/OSF.IO/R3H5Q>