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Opinion Piece

Invisible in the City: How to Overcome a Blind Faith in Evidence-Based Design That Fails People at the Margins

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Abstract: Evidence-based design (EBD) offers a promising model for shaping the built environment and is often promoted as a tool for advancing equity goals. Yet, a blind-faith in the generic takeaways from research underplays the importance of meaningful group differences and disproportionately harms people who are already relegated to the margins: Black Indigenous and People of Color (BIPOC), women, LGBTQIA+, and people with disabilities, among others. While it's reasonable for designers to want confidence in their work, the most effective strategy for good space design is a rigorous and inclusive fact-finding approach that engages the full spectrum of intended users through a variety of methods and adjusts, as needed, to address biases. Ensuring that our research approaches are inclusive and expansive leverages the opportunity of EBD to truly deepen our understanding of the connections between place and people's well-being.

Implications: This piece encourages built environment professionals to employ a conscious, mixed-method research approach to develop a deep and nuanced understanding of the experiences of end users. By highlighting the experiences of marginalized populations, specifically, urban designers, planners, and architects can more precisely accommodate meaningful differences in user needs and preferences, thereby enhancing the ability to shape places that broadly boost peoples' health, happiness, and well-being.

Keywords: mental well-being; evidence-based design; inclusivity; research design; participatory design; marginality; data invisibility; urban design; environmental psychology; mixed-method triangulation

1. Introduction

The allure of data is powerful. A proposal that's tied to hard-and-fast numbers is more easily defendable, more swiftly supported. It's no surprise, then, that a data-informed approach to design has stepped more into the spotlight ever since Florence Nightingale presented her "pavilion-ward" hospital design in 1858, and certainly since Roger Ulrich's formative 1984 findings that nature views accelerated surgery recovery (Kisecky, 2024). Today, an evidence-based design (EBD) approach, by which designers are using available research to guide decisions about the built environment and improve health and well-being outcomes, is touted as a means to achieve equity goals, with some going so far as to argue that "ignoring evidence-based design can be a source of clinical, ethical, legal, and organizational liability" (Hamilton & Pentecost, 2024, p. 932). While EBD certainly provides a deeper understanding of well-being outcomes, the picture it paints may be incomplete. Whether intentionally or not, EBD sometimes ignores the experiences of entire populations. Only a more inclusive and extensive effort to understand and accommodate a variety of experiences can yield equitable and high-quality designs that enhance well-being.

Information availability has expanded exponentially in recent decades. Researchers in 2013 suggested that more than 90% of the world's data at that point had been generated in just the two years prior (SINTEF, 2013). Based on Buckminster Fuller's 1981 "knowledge doubling curve," researchers at IBM then projected that knowledge would soon double

every 12 hours (Schiling, 2013, as cited in Chamberlain, 2020). Surely this must be a good thing, right? For centuries, design professionals have relied on instincts, trends, and best practices to guide our decisions. In recent years, the development and rising availability of biometric technology (which measures an individual's biological and behavioral responses to stimuli) has permitted us to augment design processes. Findings can quantify the physiological and psychological impacts of various design decisions on the people we're designing for. We now have measurable confirmation that our instincts have (usually) been on the right track! And as our instincts are reinforced, our trust in the ability of biometric data—and data more generally—to measure environmental preferences and inform design decisions has grown without objection. Finally, it seems, we have an infallible method for justifying our work and shaping places that people enjoy.

Yet, there are very real differences in experiences of place—both at the individual level and across population groups. Put simply, different people will experience the same place differently. Our own unique backstories, circumstances, cultures, and mental associations all come together to influence our perceptions and interpretations. Additionally, the experiences within broader population groups (e.g., people with disabilities, People of Color, different age groups, etc.) vary between individuals despite sharing other aspects of their identities. This is why, for instance, it's dangerous for me to assume that all other women think and feel as I do, given that there's a mosaic of distinct identities between us.

Beyond our external identities, each of us lives in a rich internal world which influences how we perceive the world outside us. Intraindividual variability adds a layer of complexity to our desire to quantify human experiences in space: not only do responses vary from person to person, but one person's response to the same space may vary from day to day.

So, while it would be lovely to say "people respond positively to this kind of space" or, even more narrowly, to say something like, "women prefer this kind of space", the reality is that the data we use to back-up such claims are imperfect and often don't account for population and individual variations.

2. Shortcomings in Research

One of the most significant shortcomings in research design happens when studies are conducted with homogenous populations. Historically speaking, the default study subject was a white, cisgender male (Phillips, 2020; Boyle, 2021; Baumgartner-Diolaiuti & Johnson, 2025). Much of modern-day medical knowledge grew from observations, studies, and clinical trials that lacked a broad spectrum of participants reflecting diverse backgrounds. This omission has yielded incomplete or misinformed understandings of the human body, which can ultimately lead to a failure to recognize signs of a serious condition or, worse, a fatal mis- or missed diagnosis. For example, emphasis on the white, cisgender male experience permeates and influences public knowledge to the detriment of "other" population groups. Approaching 40 years old, I was myself shocked to discover only this past year that one of the most widely recognized warning signs of a heart attack—pain in the left arm—is less likely to be experienced in white women, who instead might notice fatigue, nausea, or unusual back pain. Meanwhile, one of the only predictive symptoms of a heart attack for Black males is abnormal sweating (Allabban, Hollander, & Pines, 2017).

Of course, the tendency toward a homogenous sample is not limited to research in the medical field. We see similar omissions of populations, for example, in the images used by AI systems to train driverless cars. As a result, driverless cars are less likely to detect children and people with darker skin tones (Li et al., 2024). Or, consider how women are dominant users of transit systems, yet these systems were primarily designed for men (Halais, 2020). Many studies, whether intentionally or implicitly, manage to underrepresent or fully exclude entire sub-populations across lines of race, ethnicity, age, ability, income, and so on. Incomplete data generated through studies of limited populations compromise the integrity of research and make it impossible for the findings to be representative of experiences more broadly (Figure 1).

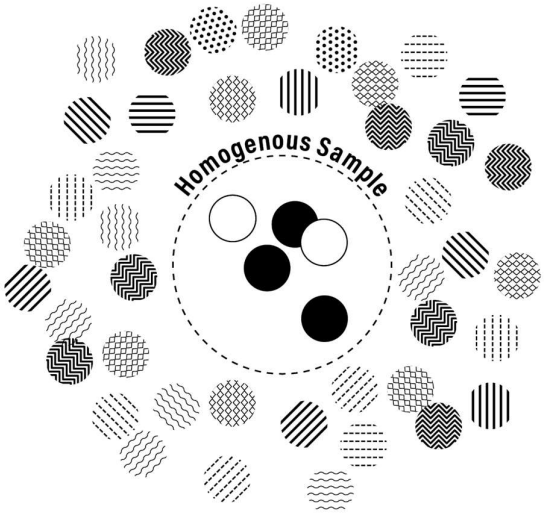

Figure 1. Limit of Study With Homogenous Population Samples.

As a direct result of such criticisms, researchers in recent years have been more deliberate about including diverse populations. Nevertheless, this solution, too, is imperfect. A diverse cohort matters little when research findings focus on generalizations and averages while ignoring the distinct, individual experiences at the margins (Figure 2). As designers of the built environment, when we feed our decision making with generic takeaways, we fail to realize that doing so may shape spaces that are challenging or wholly unwelcoming for certain people.

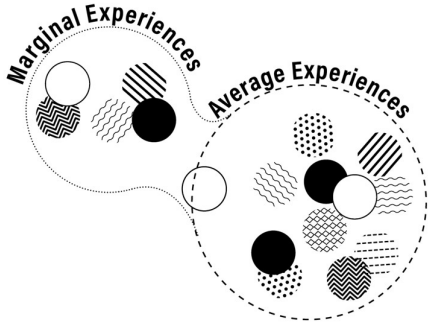

Figure 2. Generalized Results Ignore the Experiences at the Margins.

One might argue that the aim of EBD, as a public health approach, is to benefit the greater good. That goal, however, does not justify a narrow focus on the average experiences of a normative population. The greatest good will only be realized when a variety user needs inform design decisions. And designing for the specific needs of people at the margins often yields surprising, innovative solutions that benefit the broader population. When curb ramps were pioneered in the 1960s, for instance, wheelchair users weren't the only people to benefit from this new sidewalk design feature; rather, curb ramps have since improved the lives of people pushing strollers, young children learning to walk, people with limited ranges of mobility, individuals with grocery carts, delivery people maneuvering dollies, travelers with rolling suitcases, and many others.

While EBD taps into the power of scientific evidence to guide decision-making, until we benchmark our effectiveness by our ability to involve a full spectrum of participants across a range of study methods, we will never adequately incorporate the needs of all potential users into our designs.

3. An Equity Opportunity

Data are sometimes seen as a means to promote equity; but, as I hope is now clear, for research to be a successful equity tool, we need to first acknowledge and resolve the bias inherent in our methods. Objective data is a fallacy. Everything in research and data collection—from research design and analyses to the way we package and deliver our findings—is susceptible to human biases and manipulation. Recognizing this is particularly important in our current political landscape where, in the United States and elsewhere, values like equity and inclusion are coming under violent attack.

The true equity practice, here, should be an interrogation of our blind-faith in data as a manual for design. Overly relying upon and trusting data at face-value glosses over the need to account for meaningful group differences, which disproportionately harms people who are often already relegated to the margins: Black Indigenous and People of Color (BIPOC), women, LGBTQIA+, people with disabilities, and the oldest and youngest among us, to name just a few.

It's understandable to want a straightforward approach—something like a formula, template, checklist, or prescription that guarantees good design. But the truth is, we don't have a one-size-fits-all solution. We will *never* have a one-size-fits-all solution, because humans are each vibrant and exceptional beings; there are no two alike. Further, what one prefers or responds positively to today may very well shift by tomorrow.

The only surefire strategy for good space design is to directly engage the specific individuals who are likely to use that space in the planning and design process.

3.1. Alternative Research Design

Designers have the power to generate far reaching positive impacts through the built environment by deliberately augmenting EBD with a more consious process. In its earliest English usage, the term "conscious" conveyed an awareness of wrongdoing. To be conscious in our design work is to recognize pitfalls in our foundational understandings and make reparations—fortunately, the word "conscious" also describes a means to that end. "Conscious" is a derivative of the Latin *con* (together with) and *scire* (to know). Conscious discovery is about a collective effort to unerarth wisdom beneath the surface, to trust and value insights from lived experiences, and to share that knowledge widely.

Conscious design research, therefore, expands EBD by elevating the importance of subjective, anecdotal, and qualitative findings and incorporating participatory co-design methods in which project teams are designing with (rather than for) the intended occupants of a space.

3.1.1. Demand Inclusive Research Design

The first step to a conscious, user-centered EBD process is utilizing reliable datasets built through inclusive methods. A deliberate effort must be made to illuminate the experiences of a broad and diverse population.

Studies that intentionally center the experiences of often marginalized communities offer a keen awareness of the potential differences among population groups. Research time has been increasingly dedicated to such explorations; for example, Chaney, et al. (2024) employed a cross-sectional survey using the Qualtrics heat map tool to demonstrate gender differences in assessments of safety when viewing college campus images. Another study, which focused on racial variations in perceptions, identified a reduced perception of safety among Black youth when exposed to White-dominated neighborhoods for those youth who had spent more time in White areas (Browning, et a., 2024). By deliberately exploring the experiences of marginalized populations, we can inform and produce more equitable design solutions that serve the needs of our most vulnerable communities.

3.1.2. Employ a Triangulated and Participatory Process

Relying on objective data, alone, is a missed opportunity to seek intimate knowledge from the intended users of a space. A mixed-method and place-based approach exposes a much more nuanced understanding. In talking about her *Toolkit for the Ethnographic Study of Space* (TESS), public space researcher Setha Low has emphasized the value of a triangulation technique in providing rapid, more expansive and more reliable analyses (Edmunds, 2025; Taplin, Scheld, & Low, 2022). Projects that use of a range of research techniques can gain insights across different populations, dimensions, experiences, and data types (Figure 3).

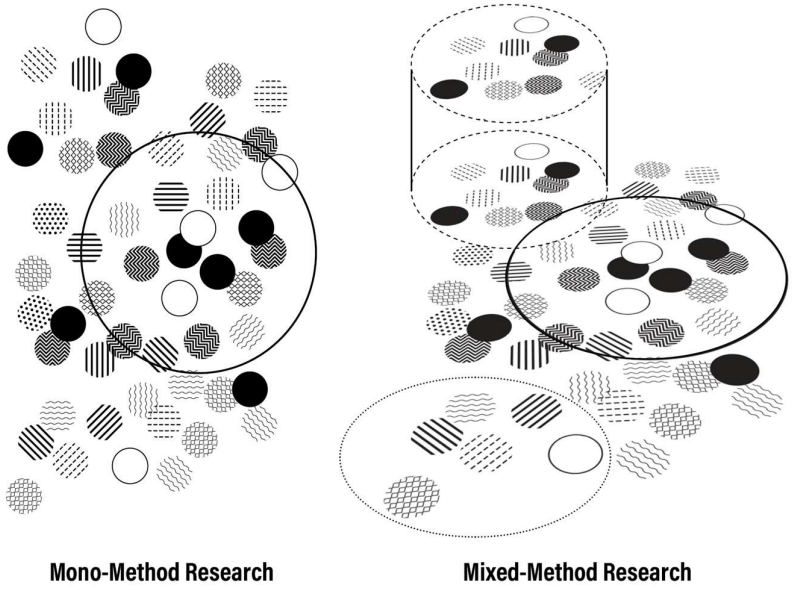

Figure 3. Comparison of Potential Data Capture Between Mono-Method Versus Mixed-Method Research.

Layered research methods can also help to reveal differences in findings across methods. For example, one study compared peoples' perceptions of urban spaces using a combination of subjective evaluation (creating mental maps) alongside more objective measures (Heart Rate Variation (HRV)). This dual approach found discrepancies between the participants' recorded HRV measurements and their reported feelings related to the same space (Agustí et al., 2019). In another study, researchers at the University of Michigan evaluated the impact of time spent in nature compared to time in urban environments. The researchers used the Positive and Negative Affect Schedule (PANAS) to investigate effects on mood, and employed a backwards digit-span task to assess memory recall. Interestingly, memory recall improved after time in nature irrespective of changes in mood (Berman et al., 2008). In a recent *Speaking of Psychology* podcast episode, one of the study authors, Marc Berman, further expounded that participants "did not show mood benefits walking in January, but they showed the same memory and attention benefits as the people that walked in June" (Mills, 2025).

While biometric data are helping to illustrate the very real physiological effects of spaces on individuals, those findings might not comport with a person's perception and emotional response—both of which are valuable measures of impact. A mixed-method research approach that incorporates subjective data and participatory co-design tools can provide a richer, more layered understanding of peoples' full experiences.

3.1.3. Adjust and Evaluate

Finally, whether conducting primary research or pulling from secondary sources, research should always be accompanied by an acknowledgement of biases and gaps to inform needs for additional study. Further, it's important to continually step back from our work to assess how effective we've been in our inquiry. Knowledge is constantly expanding, and new information can have significant impacts on how we (re)interpret our understandings of the world. By always questioning our findings and viewing them from different angles, we can spot weaknesses in our data and work to fill in all the knowledge nooks and crannies.

4. Conscious Design Research in Action

The potential to enhance project design decisions through a conscious, mixed-method form of EBD extends to all built environment professionals. Pairing existing evidence with qualitative user-centered research will capture a fuller range of experiences and needs that can be accommodated through design decisions (Figure 4).

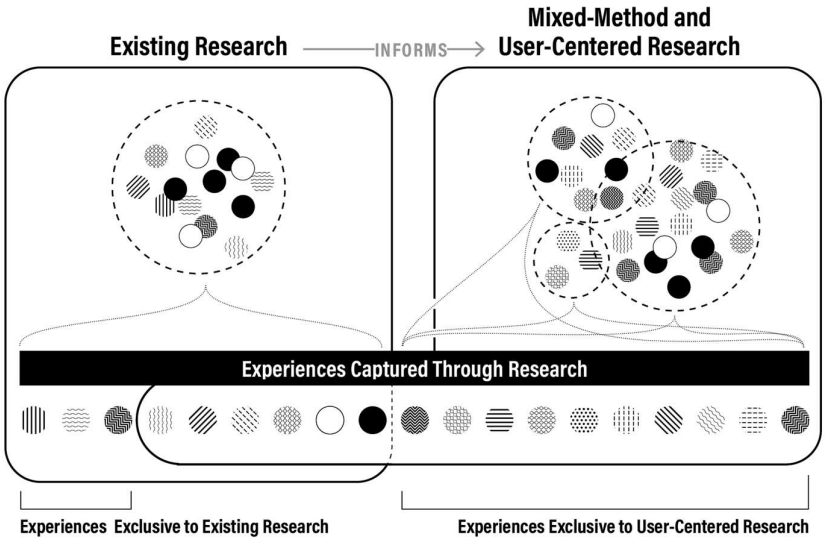

Figure 4. Visualization of the Additional Experiences Captured through a Mixed-Method and User-Centered Research Approach

Any design project stands to gain much by facilitating a deeper exploration of the needs and experiences of the intended end users. For instance, in designing a new museum, architects may tap into existing research on human perceptions of light and sound, but also engage an advisory committee of disability experts with lived experience who provide additional insights on the full sensory environment and how various forms, features, or stimuli either hinder or enhance the experiences of people with disabilities. Or, a library undergoing renovations in the children's section may complement research on early childhood development with findings from a design workshop that focused on the needs and expectations of local neurodiverse children. Landscape designers creating a new park—in addition to incorporating research on the restorative properties of nature—could hold small group conversations with women and LGBTQIA+ individuals to learn how to most effectively create a space that feels safe and welcoming to these communities. Planners working on a transportation project could draw on studies of navigation in the built environment, while also inviting older adults on a site walk to understand their unique needs for visual access and clear wayfinding. Meanwhile, a design team behind a new community center might host an oral history and storytelling campaign that reveals common threads between the area's growing refugee population and its rich immigrant history, and then use research on belonging to guide the selection of imagery used throughout the facility. In all of these examples, design teams embrace conventional EBD while also employing more inclusive and expansive methods that pay particular attention to the ways marginal experiences deviate from the researched norm.

5. Conclusions

EBD approaches promise to generate more informed decisions about the built environment; but, without a conscious effort to include voices at the margins and employ a mix of research methods, we miss our opportunity to truly deepen our understanding of the connections between a place and people's well-being.

All the information we could ever want or need is waiting for us, but too often it's neglected in our research—whether in collection or evaluation. The risk of data invisibility, where marginalized groups are missing from data, can be fully eliminated by prioritizing the voices, needs, and experiences of those most historically underrepresented. Further, by

inviting direct participation from the intended users, we can expand objective findings with subjective evaluations. Ensuring that our EBD approaches are conscious, inclusive, and expansive will help us move one step closer to effectively achieving equitable, high-quality environments that boost happiness, health, and well-being.

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