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Folk Epistemological Attitudes Toward Using Virtual Reality (VR) to Learn About Others

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Abstract

Virtual reality (VR) simulations purport to provide a uniquely immersive means of understanding experiences different from our own, potentially serving as "empathy machines". The utility of such simulations, however, is controversial. We examined people's preferences for learning about others' experiences of visual impairment and sexual harassment, through VR versus firsthand testimony. We find that people have a general preference for VR over testimony, expecting VR to be able to provide a high understanding of others' experiences. The preference for VR over testimony was more pronounced for learning about visual impairment than sexual harassment, and prior experience with sexual harassment reduced the perceived value of VR relative to testimony. These findings raise concerns about epistemic justice, as reliance on VR may undermine deference to firsthand accounts.

Keywords: Virtual reality, simulation, testimony, standpoint epistemology, experience, social learning, empathy

Introduction

Virtual reality (VR) technology allows users to undergo immersive, realistic simulations of experiences. Over the last decade, VR has been increasingly used to "recreate" particular experiences and situations with the aim of letting users "walk in someone else's shoes." (e.g., Yee and Bailenson, 2006; Milk, 2015). This use of VR is driven by the premise that if people are able to realistically simulate the conditions that someone else experiences, they can gain a more accurate understanding of what it is like to be that person. Many of these first-person embodiment VR simulations are designed with the intent of promoting social change and awareness for marginalized, underrepresented, or vulnerable groups–e.g., simulations of incarceration (Peters, 2016), disability (Embodied Labs, 2018), and racism (Cogburn et al., 2018). However, the effectiveness of these simulations in achieving their intended goals remains debated. In this paper, we investigate how laypeople understand and evaluate VR simulations as tools for learning about others' lived experiences.

The idea that one must experience something in order to truly know it traces back to philosophers like John Locke (1690), who argued that all knowledge originates in direct, first-person experience. More recent theories in philosophy and psychology similarly explain our ability to understand other people's thoughts and feelings as requiring simulation based on our own prior experiences and mental states (e.g., Gordon, 1986; Heal, 1995; Currie & Ravenscroft, 2002; Goldman, 2006; Gallese & Goldman, 1998). From this perspective, VR simulations might seem particularly well-suited to facilitate understanding another individual's experience by offering a vivid, immersive proxy experience. Indeed, some studies suggest that VR simulations increase people's confidence in their own understanding of what it is like for someone else to go through the experience being simulated (e.g., Flood, 2023; Tomy et al., 2023; Villmore et al., 2024).

Yet this confidence may be misplaced. Critics argue that VR simulations can mislead users, producing distorted or even harmful interpretations of others' experiences (Silverman et al., 2015; Ramirez & LaBarge, 2018; Ramirez et al., 2021; Sora-Domenjo, 2022; Bloom, 2024; Messeri, 2024). For example, Silverman et al. (2015) found that disability simulations designed to foster empathy often exaggerated the difficulties of disability while ignoring the adaptability and agency of disabled individuals.

Standpoint theory offers a powerful framework for understanding these concerns. It emphasizes that knowledge is shaped by one's social position and lived experience (Harding, 1991; Collins, 1990; Anderson, 2024). A core idea is that people's uniquely situated past experiences provide interpretive frameworks that influence how they understand and interact with new experiences. Thus, even if two people were to experience an identical event, their reactions, feelings, interpretations, may differ significantly. In other words, VR—however immersive—may offer a shallow or false grasp of others' lived experiences, particularly those shaped by complex social and cultural factors. From this view, some scholars have argued that VR cannot enable users to truly understand lives very different from their own (Ramirez et al., 2021; MacArthur et al., 2024; Bloom, 2024; Messeri, 2024), that designers should exercise great caution, or even that the use of VR as experience simulations should be abandoned entirely (e.g., Ramirez et al., 2021; Bloom, 2024; MacArthur et al., 2024).

An alternative approach may lie in fostering epistemic humility—promoting awareness of the limitations of one's knowledge and the conditions under which it is formed. In the context of VR, this would mean encouraging users to recognize the limits of what they can learn from a simulation and to be cautious in claiming understanding of another's perspective. However, little research has examined what people believe they can learn from VR simulations or how confident they feel in the knowledge gained. What do people

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expect to gain from these simulations? How much humility do they exercise when interpreting such experiences? And what factors influence these attitudes?

These questions are not only practically relevant for designing more responsible uses of VR but are also theoretically meaningful. They touch on broader issues in *folk epistemology*—people's theories about how knowledge is acquired, including their beliefs about their own ability to know and the reliability of different sources of information (e.g., Kitchener, 2002; Heintz & Taraborelli, 2010; Gerken, 2017).

One relevant line of work shows that adults, like children, tend to be egocentric in perspective-taking: they often overproject their own beliefs and feelings onto others (e.g., Epley et al., 2004; Keysar, Lin & Bar, 2003; Apperly, 2012). Overcoming this bias requires meta-awareness of the bias itself, motivation to overcome it, self-other differentiation, and conscious effort (see Todd & Tamir, 2024 for a review). Given how VR experiences are designed to allow the user to experience the simulation as if it were their own experience, it may take a great deal of awareness, caution, and humility for participants to overcome their egocentric bias. Unfortunately, the same feature of VR may make epistemic humility difficult. People tend to trust and privilege their own sensory-based, first-hand experience (e.g., Gopnik, 1993; Sperber & Mercier, 2017). Because VR gives the impression of direct experience—letting users "see for themselves"—it may be perceived as a particularly trustworthy way of learning.

In this study, we explore people's beliefs about VR's epistemic value. We presented participants with written, verbal descriptions of two commercial VR simulations depicting the experiences of two fictional individuals (adapted from *The Messy Truth* VR series, a private company's training program). Participants were asked to imagine going through the simulations described and respond to questions probing their beliefs about what they would learn, such as how much insight they thought they would gain into the simulated subject's thoughts and feelings, how well they expected to understand what it's like to go through the experience, and how confident they expected to feel in sharing what they learned with others. We predicted that participants would place high epistemic value on VR simulations, despite their limitations.

Further, we compared participants' judgments about VR with their judgments about *testimony*—specifically, listening to recordings of the same fictional individuals recounting their experiences in their own words. Testimony requires listeners to rely on someone else's perspective and trust their account (e.g., Fricker, 2004; Lackey, 2011; Green, 2008; Lipton, 1998). If participants appreciate the epistemic value of others' perspectives, they should favor testimony, especially for socially situated experiences that cannot be easily simulated.

We also explored whether people believe VR is better suited for learning about some types of experiences than others. We presented participants with two vignettes: one describing a person experiencing verbal sexual harassment, and another describing a person living with macular degeneration (a visual impairment). We then asked participants to evaluate how well VR (versus testimony) could convey each experience.

One hypothesis was that participants may see VR as particularly valuable for learning about *sensory* experiences, such as visual impairment, because VR simulates perceptual inputs. After all, influential philosophers have argued that the phenomenology of visual experience can be only learned by direct experience (e.g., Jackson, 1986). In contrast, experiences like verbal sexual harassment (e.g., being cat-called)—which involve social dynamics and complex personal interpretations—may be seen as less amenable to simulation and better suited to testimony. On the other hand, participants may recognize that being visually impaired is also a social experience, and that there may be important sensory components of experiencing sexual harassment, and therefore have similar expectations about the utility of VR simulations for learning about both kinds of experiences.

Finally, we examined whether participants' own prior experiences shaped their attitudes. Participants were asked whether they had encountered situations similar to those being simulated. We explored whether such prior experience influenced their beliefs about the utility of VR and testimony in learning about those scenarios.

Methods

Participants

96 U.S.-based participants were recruited from Prolific (43 men, 51 women, 2 "other"). Two participants were excluded from our analysis for taking excessive time to complete the survey and expressing confusion about survey questions. Participants gave consent according to the Yale University IRB, and were paid $7.25 per hour.

Experimental Stimuli & Procedures

All participants were asked to read the same two vignettes in a randomized order. The vignettes were adapted from existing VR simulations created to help people understand the experiences of sexual harassment (SH) and visual impairment (VI). These simulations were selected because they were designed to be brief in duration, to inform the participant about the experiences of another individual, and to do so by "placing" the participant in the subject's shoes. The visual impairment simulation was intended for use by caregivers and healthcare providers, while the sexual harassment simulation was oriented towards a broader audience. The subjects were given fictional names: Martha (degenerative visual impairment) and Angie (sexual harassment).

Martha: Visual Impairment

Martha is a 72-year old woman with a degenerative visual impairment. She can still see, but her vision is blurred. This is a description of one experience from Martha's life:

Martha is attending a family dinner. Individual faces at the table look blurry to her. Suddenly, she accidentally knocks over her drink, causing her family members to crowd around her and make a fuss.

Later, Martha's son takes her to visit a doctor, who diagnoses her condition and talks with her about options for treatment, including taking special vitamins that slow the degeneration or undergoing eye surgery.

Angie: Sexual Harassment

Angie is a retail worker. This is a description of one experience from Angie's life:

Angie is getting a performance review from her assistant manager Cleo, who compliments Angie on her work. Angie's boss, the manager, walks in and starts making sarcastic and passive-aggressive comments towards Cleo, referring to her as a 'girl' and eventually telling her to leave.

When Angie is alone with the boss, he starts flirting with her, making suggestive comments, and moving closer towards her. At the end of the conversation, he squeezes her leg under the table and suggests that if she wanted to work more shifts, she would have to "play the game."

Virtual reality instructions Participants were asked to imagine going through VR simulations from a first-person perspective, as if they were the person to whom the experience happened ("Imagine you are going through a VR experience of this experience, embodying [Martha/Angie]"). The descriptions themselves were written in third-person. Participants then answered questions about how much insight they expected to gain about how Martha/Angie felt and thought (INSIGHT, "How much insight do you think [the VR experience/listening to the personal story] will give you about what [Martha/Angie] thought and felt?", scale: no insight at all → as much as if I were [Martha/Angie]), expected understanding of what it's like to be the person (UNDERSTANDING, "After [having this VR experience/listening to the personal story], to what extent would you understand what it's like [to be a person with visual impairment/experience sexual harassment]?", scale: not understand at all → understand as much as I understand my own life), and how confident they felt about the accuracy of the knowledge they obtained from the simulation (CONFIDENCE, "After [having this VR experience/listening to the personal story], to what extent would you feel confident telling others what it's like to [be a person with visual impairment/experience sexual harassment]?", scale: not at all confident → as confident as if I were talking about myself).

Testimony instructions To evaluate the differences between participants' valuation of VR and direct testimony, we also asked participants to imagine listening to a recording of Martha or Angie speaking about what their experiences were like for them. They then answered similar questions about their expected reactions to and knowledge gained from the recording, such as: "To what extent would you understand what it is like to experience sexual harassment from listening to the personal story?" with a unipolar sliding scale ranging from "Not at all understand" to "As much as I understand my own experiences".

Finally, participants were asked to rank their preference for one medium over the other (VR or personal story) in the following way: "If someone wanted to learn about what it is like to be a person with a visual impairment, which of these would they learn more from? Choice 1: VR: Going through a VR simulation of Martha's experience, embodying Martha; Choice 2: Personal story: Listening to a recording of Martha's personal story about her experience."

Results

Participants are optimistic about the epistemic value of VR and prefer it over testimony

When asked whether they preferred VR over testimony when learning about the fictional scenario subject's experience, participants strongly favored VR (one-tailed binomial test, $p<.001$) (**Fig. 1, left**). Further, we found that across both scenarios, participants showed high expected insight into the subjects' thoughts and feelings, understanding about their experiences, and confidence telling others about it, for learning through VR (scenarios combined: Insight: M=71.60, 95% CI [67.93, 75.28]; Understand: M=77.82, 95% CI [74.57, 81.08]; Confidence: M=68.94, 95% CI [65.22, 72.66]) (**Fig. 1,** right).

In comparison, participants expected less understanding of the experiences and confidence telling others, but similar insight, when learning by listening to the person's testimony (Insight: M=69.67, 95% CI [66.73, 72.60]; Understand: M=61.97, 95% CI [58.52, 65.43]; Confidence: M=51.59, 95% CI [47.55, 55.63]; mixed effects linear models looking at the effect of mode (VR vs. testimony), with participants as random effects, Insight: $F(1,95)=0.83$, $p=0.4$; Understanding: $F(1,95)=57.56$, $p<.001$; Confidence: $F(1,95)=62.78$, $p<.001$) (**Fig. 1,** right).

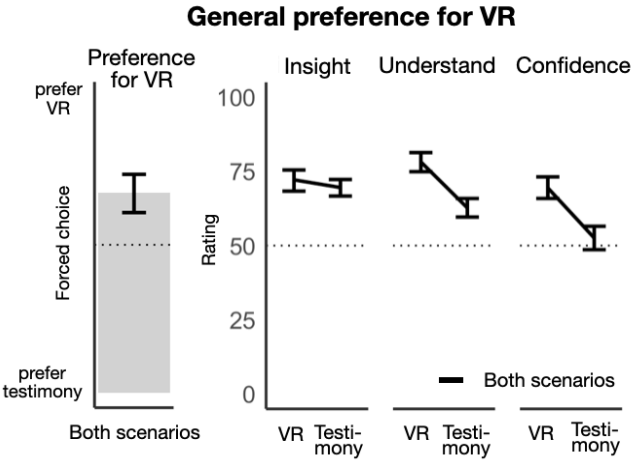

Figure 1. Preference for VR (forced choice) and ratings for Insight, Understanding, and Confidence. Error bars are means +/- 95% confidence intervals.

VR preference is stronger for visual impairment than for sexual harassment

Participant preference for VR depended on the type of scenario (sexual harassment vs. visual impairment). There was a significant cross-scenario difference in how participants responded to the forced choice question, with stronger preference for VR for visual impairment than for sexual harassment (VI: 79.16% preference for VR, 95% CI [70%,86%], binomial test, p<.001; SH: 57.29% preference for VR, 95% CI [47.3%,67%], binomial test, p=0.092; logistic regression, effect of scenario (VI vs. SH): F(1,190)=8.92, p=0.003) (**Fig. 2,** left).

There were significant differences in expected insight, understanding, and confidence across scenarios as well (**Fig. 2,** right**,** for sexual harassment - Insight: M=68.21, 95% CI [62.60, 73.82]; Understanding: M=74.61, 95% CI [69.29, 79.94]; Confidence: M=72.16, 95% CI [67.48, 76.84]; for Visual Impairment - Insight: M=75.00, 95% CI [70.25, 79.75]; Understanding: M=81.03, 95% CI [77.29, 84.77]; Confidence: M=72.16, 95% CI [67.48, 76.84]; LMEM, 2-way interaction between mode and scenario, for Insight: F(1,95)=27.82, p<.001, effect of mode: F(1,95)=0.45, p=.51, effect of scenario: F(1,95)=0.10, p=.75; for Understanding: interaction F(1,190)=21.43, p<.001, effect of mode: F(1,95)=34.84, p<.001, effect of scenario: F(1,135)=0.19, p=.66; for Confidence: interaction F(1,190)=15.50, p<.001, effect of mode: F(1,95)=43.70, p<.001, effect of scenario: F(1,135)=0.002, p=.96).

For the visual impairment scenario, participants consistently responded that the VR would be more useful (analyzing VI only, effect of mode for each question, Insight: F(1,95)=8.55, p=0.004, Understanding: F(1,190)=54.91, p<.001, Confidence: F(1,95)=57.71, p<.001). For the sexual harassment scenario, participants thought that VR would provide more understanding and give them confidence, but the preference for VR was not present for expected insight (analyzing SH only: effect of mode, Insight: F(1,95)=2.74, p=.1, Understanding: F(1,95)=7.21, p=.0086, Confidence: F(1,95)=12.50, p<.001).

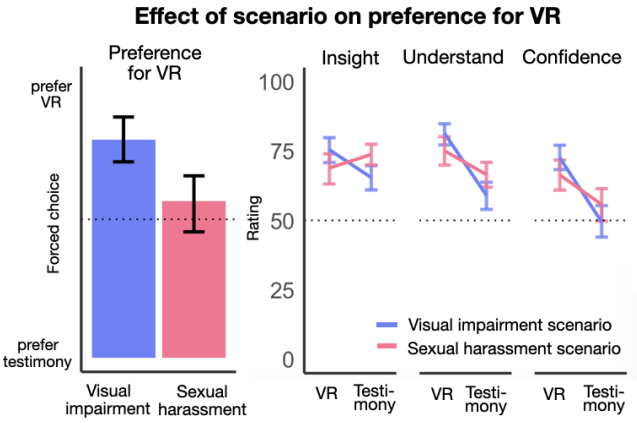

Figure 2. Preference for VR and ratings about Insight, Understanding, and Confidence split by scenario (sexual harassment and visual impairment).

Participants with prior experience with sexual harassment are more skeptical about VR

We also explored the effect of prior experience with sexual harassment on preference for VR over testimony. 43 out of 96 participants had prior experience with sexual harassment and "Yes/No" question, and 21 out of 96 had prior experience with visual impairment.

We analyzed the effect of having prior experience with VI/SH on preference for VR, for each scenario. For learning about VI, prior experience did not have an effect; both those with and without prior visual impairment experience highly preferred VR (**Fig. 3** left, logistic regression, effect of VI experience on VR preference for VI: F(1,94)=0.05, p=.8).

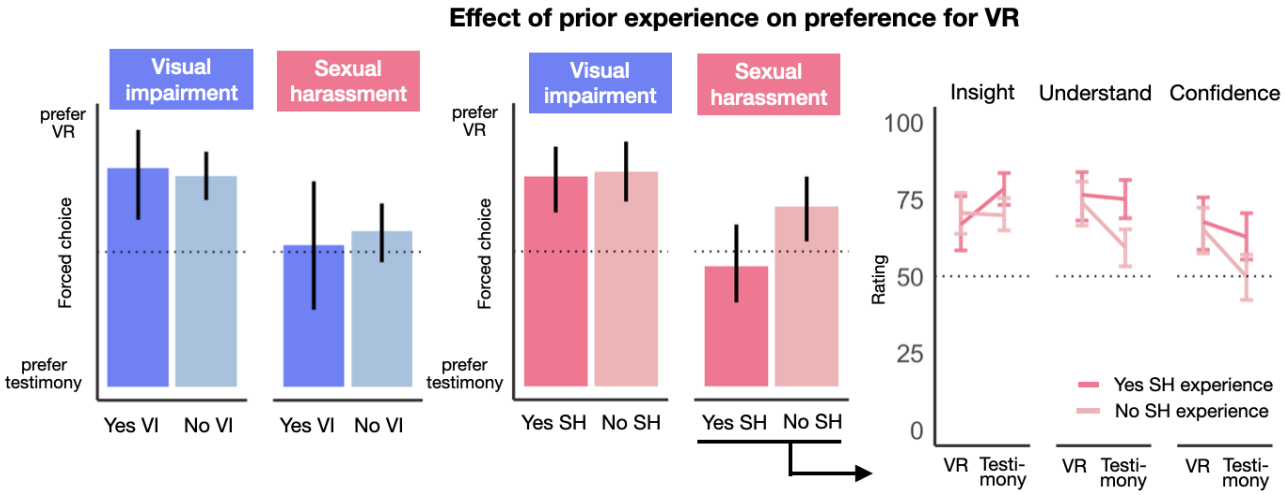

Figure 3. Preference for VR (forced choice) and ratings for Insight, Understanding, and Confidence split by prior experience with sexual harassment and visual impairment.

Prior experience with VI also did not affect participants' preference for VR for learning about SH (effect of VI experience on VR preference for SH: F(1,94)=0.19, p=.66).

In contrast, prior experience with sexual harassment did affect preference for VR: those with prior experience showed a reduced preference for VR, for learning about SH only (**Fig. 3,** middle, effect of SH experience on VR preference for SH: F(1,97)=3.96, p=.03; effect of SH experience on VR preference for SH: F(1,94)=3.48, p=0.065; effect of SH experience on VR preference for VI: F(1,94)=0.17, p=.68).

We further examined the effect of prior SH experience on responses to detailed questions about the value of VR (**Fig. 3** right, for Prior SH Experience, VR: Insight: M=70.43, CI [64.38, 76.49]; Understanding: M=79.31, CI [74.50, 84.12]; Confidence: M=70.61,CI [65.03, 76.20]; for Prior SH Experience, testimony: Insight: M=74.42, CI [70.25, 78.59]; Understanding: M=69.27, CI [64.19, 74.35]; Confidence: M=57.27, CI [51.37, 63.17]; for No Prior SH Experience, VR: Insight: M=72.60, CI [68.06, 77.13]; Understanding: M=76.57, CI [72.08, 81.05]; Confidence: M=67.53, CI [62.47, 72.59]; for No Prior SH Experience, testimony: M=65.64, CI [61.63, 69.66]; Understanding: M=55.80, CI [51.35, 60.25]; Confidence: M=46.78, CI [41.32, 52.23]). Those without prior SH experience thought neither method would provide more insight than the other (VR: M=70.43, testimony: M=65.64), but that VR would be substantially more helpful for gaining understanding about the experience and giving them confidence in telling other people about it. However, those with prior SH experience tended toward seeing testimony as more valuable for gaining insight, and thought VR and testimony would provide similar amounts of understanding and confidence (LMEM, 2-way interaction between mode (VR vs. testimony) and prior SH experience, for Insight: F(1,94)=3.643, p=.059, effect of mode: F(1,94)=0.267, p=.6, effect of prior SH experience: F(1,94)=1.185, p=.28; for Understanding: interaction F(1,94)=4.12, p=.045, effect of mode: F(1,94)=33.93, p<0.001, effect of prior SH experience: F(1,93)=6.92, p=.01; for Confidence: interaction F(1,94)=2.00, p=.16, effect of mode: F(1,94)=42.31, p<.001, effect of prior SH experience: F(1,91)=2.78, p=.099).

Two groups of participants: skeptical and optimistic

Finally, we explored individual variation in attitudes toward VR, using exploratory k-means clustering based on answers to the three main questions (insight, understanding, confidence). The elbow and silhouette methods indicated two potential clusters of participants.

When we examined between-cluster differences in mean ratings for expected insight, understanding, and confidence when learning with VR, we found that one cluster's average ratings were significantly higher than the others for all three questions across both scenarios. The higher-rating group (Group 1) contained 54 individuals, and the lower-rating group (Group 2) contained 45 individuals (Group 1 ratings for Insight: M=68.16, CI [65.47 , 70.84], Understanding: M=70.34, CI [68.03, 72.65], Confidence: M=63.83, CI [60.87, 66.79]; Group 2 Insight: M=73.11, CI [70.13, 76.09], Understanding: M=70.55, CI [67.29, 73.81], Confidence: M=58.67, CI [55.4, 61.92]; LMEM looking at the interaction between mode and group only found main effect of group and mode, interaction for Insight: F(1,97)=0.8, p=.4; Understanding: F(1,97)=0.83, p=.4; Confidence: F(1,97)=0.04, p=.9, **Figure 4,** left).

We interpreted this difference in means to indicate that G1 participants were generally more optimistic about the epistemic value of VR, while those in G2 remained slightly more skeptical of the efficacy of VR for learning what it's like to be another person.

An examination of demographic composition within the groups identified revealed a greater proportion of participants who did not experience sexual harassment in the cautious group (Group 2, 57.78%) than in the confident group (Group

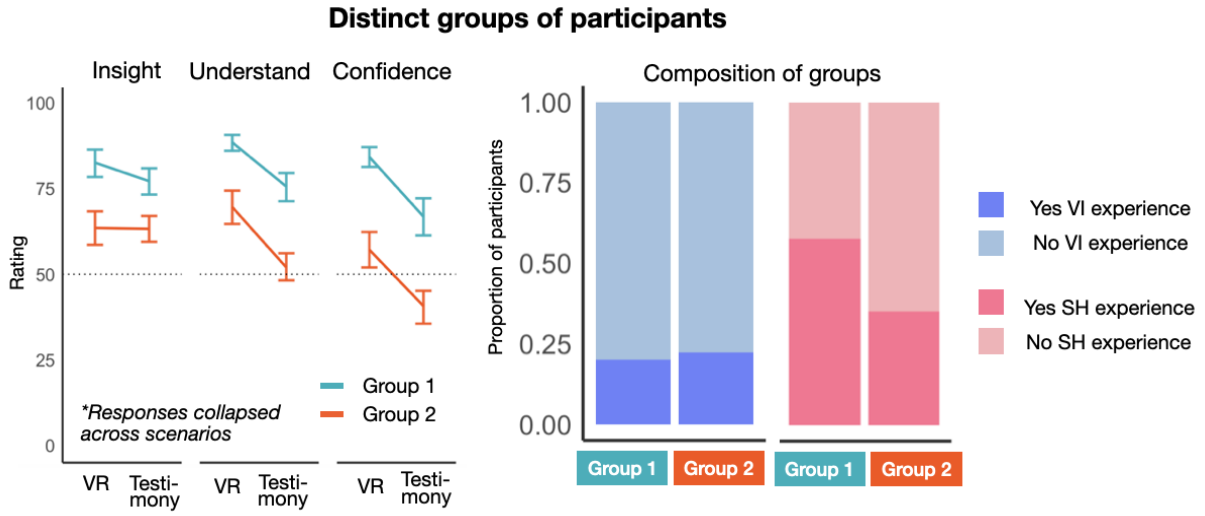

Figure 4. Preference for VR split by two groups identified through cluster analysis (left) and composition of prior experience within clusters (right).

1, 32.89%) (**Fig. 4,** right**;** $\chi^2(1)=145.64$, $p<.001$, comparing Group 1 vs. Group 2 for SH**)**. However, the groups did not differ in their proportions of people who had prior visual impairment experience (Group 1, 20%, Group 2, 22.2%, $\chi^2(1)=1.97$, $p=.2$).

Discussion

Overall, participants in this study thought they could gain substantial understanding of other people's experiences through VR simulation and tended to prefer VR over testimony. They were especially confident that undergoing the simulation would give them an understanding of what it's like to be someone with that experience. The preference for VR was more pronounced for learning about visual impairment than for sexual harassment. Prior experience with sexual harassment affected participant preference for learning about the person going through sexual harassment themselves: those with prior experience viewed VR less favorably as a way of learning compared to testimony. Further, we found that some participants were more cautious toward VR than others, although these individuals tended to be more skeptical of the explanatory value of *both* VR and testimony.

These findings suggest that people generally place a high degree of trust in VR as a tool for understanding others—potentially reflecting a tendency to overvalue firsthand, sensory-based experiences and to underestimate their own egocentric biases. The stronger preference for VR in the context of visual impairment may reflect the belief that VR is especially effective for conveying experiences with a strong sensory or phenomenological component. Future research should examine whether this pattern generalizes across a wider range of experiences to better understand how the nature of an experience shapes beliefs about the epistemic value of VR.

More work is also needed to investigate why people view VR as a more powerful source of understanding than direct testimony. One possibility is that people perceive testimony as not only less vivid and less immersive, but more subjective or unreliable as well. Whether this is a fair assumption is questionable, as VR simulations are inherently fictional reconstructions. While many programs take care to consult real people with actual experiences of the phenomenon being simulated, the re-creation of a particular "experience" is necessarily a fictional depiction that may not be representative of the experiences of others in that same group (e.g., all individuals with a particular disability; Silverman, 2015; Dean et al., 2020).

The valuation of VR over testimony raises several concerns. One is that VR may create an illusion of understanding (Keil & Rozenblitz, 2002) and demotivate one from exercising humility and effort to understand another person (Messeri, 2024; Ramirez, 2018). This lack of awareness about one's own limitations would be especially problematic because overcoming egocentric biases during mentalizing about other people requires effort (Todd & Tamir, 2024).

Further, the undervaluing of testimony raises ethical concerns. Testimony allows individuals to speak for themselves and to offer first-person insights that listeners may not arrive at on their own. When people treat VR as more reliable than the words of those who have lived the experience, it risks committing epistemic (or testimonial) injustice, where the speaker may not ignored, believed, or not listened to, even though they are providing knowledge about a subject they are well-positioned to know (e.g., Fricker, 2004; Barnes, 2016).

On the other hand, our findings also offer reason for cautious optimism. While the general trend was to favor VR, participants' responses were not monolithic. People with prior experience of sexual harassment, for instance, showed greater humility in their judgments and expressed more value for testimony compared to VR. One possibility is that they viewed the simulation as redundant—something they had no need to learn through VR because they already understood it firsthand. Alternatively, and perhaps more intriguingly, having experienced sexual harassment may have prompted participants to adopt the perspective of the speaker rather than the observer. This shift may have led them to place more value on testimony, recognizing the importance of being heard and understood in one's own words.

These results point to the complex ways in which people reason about different sources of knowledge and how their personal experiences influence their epistemic intuitions. They also suggest the need for future work on how to cultivate epistemic humility toward one's own ability to understand other people, appreciation of the testimonies of others, as well as digital literacy about the nature of VR simulations.

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Disclaimer

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