

The impact of prior information on hallucinatory perception in healthy observers

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What You See Isn't Always There

We perceive our world as visually rich and detailed, which appears inconsistent with phenomena like *change blindness* and *inattention blindness*. Such effects suggest that this sense of richness may be illusory. However, when attention is drawn to another task, participants sometimes report seeing simple objects (letters or line-squares) that were not present.^{1, 2, 3}

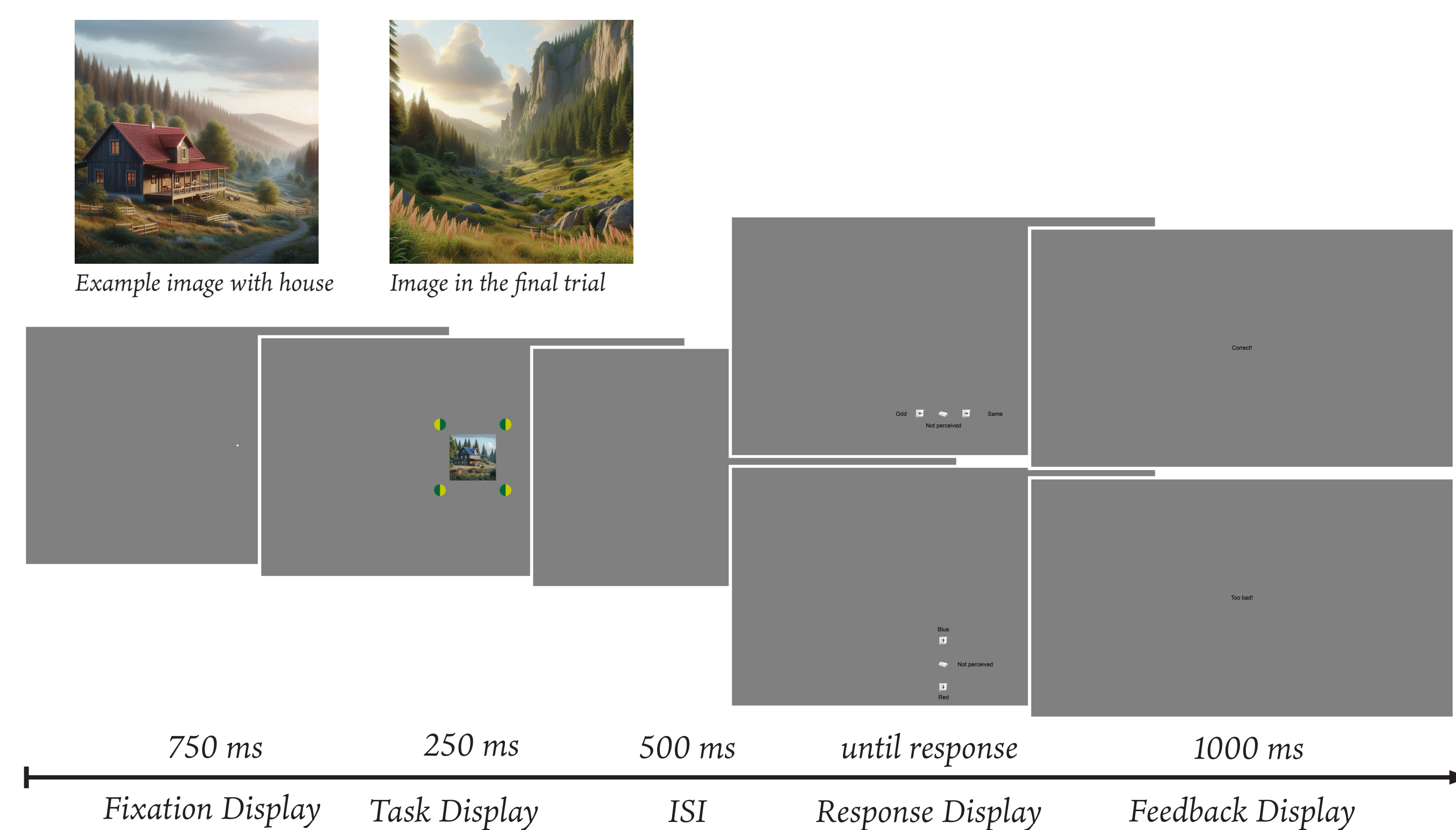
Research Question

Do participants really see an absent object in a natural scene, even when they are fully informed about the absence of that object?

Method

On 160 trials, a natural scene with a house and four disks was shown. On 80% of trials, participants were asked whether the disks were the same or different. On 20% of the trials, they were to report the color of the roof of the house (red or blue). In all trials, “not recognized” was a response option.

On the 161st trial, the house was absent, but participants were asked to report the roof color.

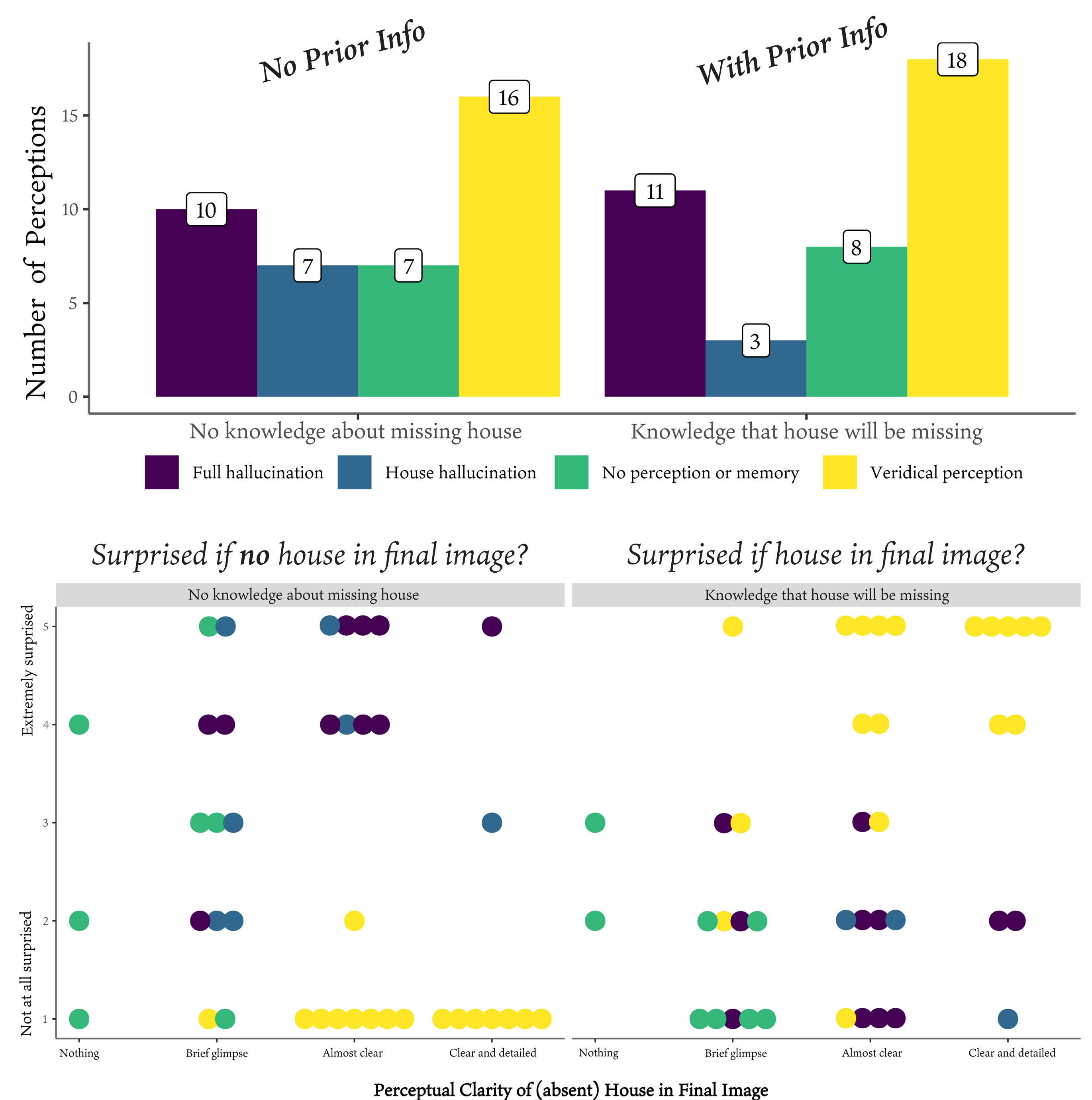


One group ($n = 40$) was told that no house would be present in the final image; the other group ($n = 40$) was not informed of this. In an immediately following interview, we asked them to report in detail what they have seen in the final image.

Semi-Structured Interview

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|---|---|---|
| <p>1 Open Questions</p> <ul style="list-style-type: none"> • Perception in last trial? • Clarity of perception? • Surprise if house was present/absent? | <p>2 Participant Ratings</p> <ul style="list-style-type: none"> • Clarity <ul style="list-style-type: none"> » 0: No perception » 1: Brief glimpse » 2: Almost clear perception » 3: Clear perception • Surprise <ul style="list-style-type: none"> » 1: Not surprised at all » 5: Extremely surprised | <p>3 Reflection and Discussion of Contradictions</p> <p>4 Direct Questions</p> <ul style="list-style-type: none"> » House and roof color seen? » Clarity of that perception? <p>5 Concluding Questions</p> |
|---|---|---|

Results



Discussion

Even with prior knowledge, 14 of 40 participants (35%) described seeing a house in a natural scene that contained no house. Most said they would not be surprised if there had been a house in the image.

Similarly, 17 of 40 participants (42.5%) of uninformed participants described seeing a house in the final image, and most said they would be surprised if there had been no house.

These findings indicate that the visual system can fill unattended natural scenes with vivid images of specific objects that are not actually present. This complements the phenomenon of *inattention blindness* with what we term *inattention hallucinations*—which might help explain why our subjective experience of the world appears visually rich and detailed.

Inattention blindness, where present objects are not seen when they are not fully attended, may have a counterpart: cases in which absent objects are consciously experienced in unattended regions.

Conclusion

We found evidence for *inattention hallucinations*, which could help explain why our perception often feels visually rich and detailed: attention gaps may be filled in with objects that are not truly present.

¹ Aru, J., & Bachmann, T. (2017). Expectation creates something out of nothing: The role of attention in iconic memory reconsidered. *Consciousness and Cognition*, 53, 203–210. <https://doi.org/10.1016/j.concog.2017.06.017>

² Mack, A., Erol, M., & Clarke, J. (2015). Iconic memory is not a case of attention-free awareness. *Consciousness and Cognition*, 33, 291–299. <https://doi.org/10.1016/j.concog.2014.12.016>

³ Mack, A., Erol, M., Clarke, J., & Bert, J. (2016). No iconic memory without attention. *Consciousness and Cognition*, 40, 1–8. <https://doi.org/10.1016/j.concog.2015.12.006>