An illusion of absence in a VR traffic scenario

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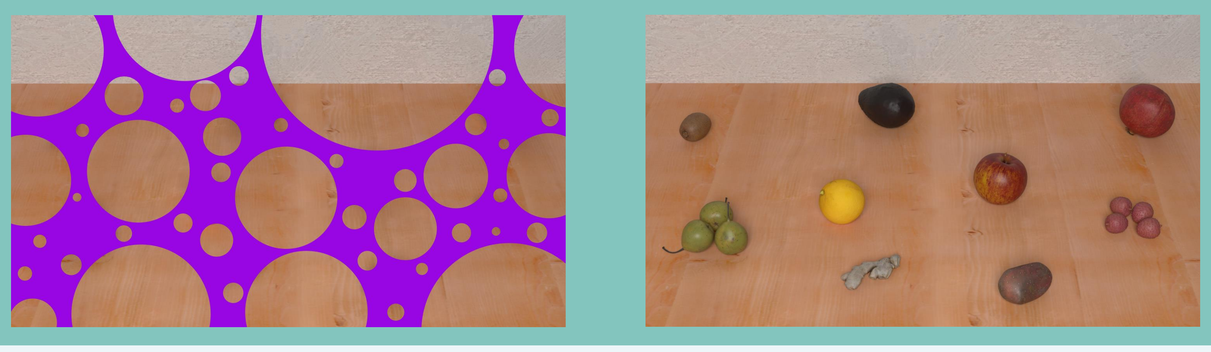
Background

Illusion of Absence

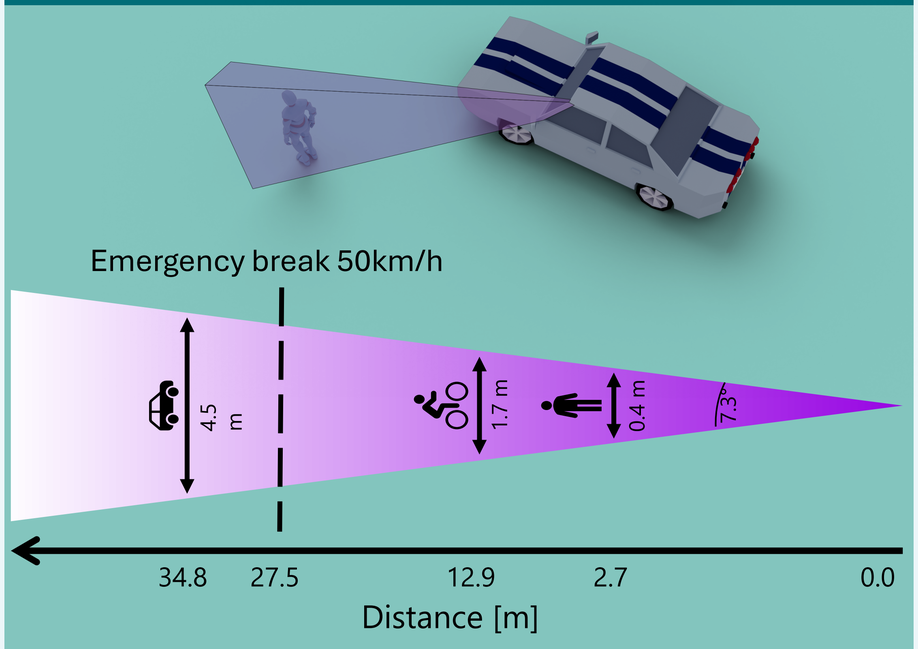
The illusion of absence is a visual phenomenon in which the space behind an occluder is perceived to be empty in a compelling way (Ekroll et al., 2017).

The smaller the occluder the stronger the illusion (Øhrn et al., 2019; Forster et al., 2025).



Our questions:
1. Can A-pillars evoke the illusion of absence?
2. Does the strength of the illusion depend on the width of the A-pillars?

A-pillar Blind Zones



Distances and sizes based on Ekroll et al. (2021).

Experiment

Participants (N=100) were presented a VR traffic scenario from the driver's point of view in which a blue car remains hidden behind the A-pillar but appears out of the blind zone at the end of the scene, resulting in a near-collision.

VR Surprise Rating Task → Description + Demonstration Task → Magic Surprise Rating Task

VR Surprise Rating Task

Q: "How surprising do you feel the appearance of the blue car was on a scale of 0 to 10?"

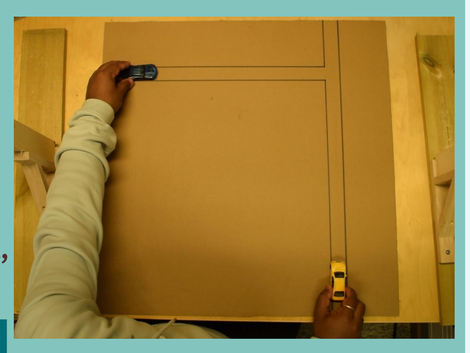
Four angular pillar widths

Description + Demonstration Task

Q: "Can you explain where the blue car came from?"

A: Yes / No

Q: "Demonstrate using toy cars ....."

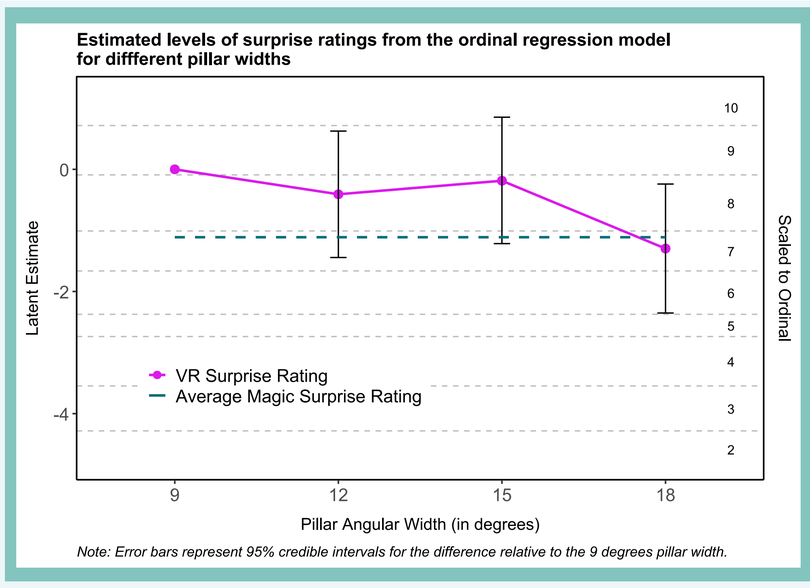


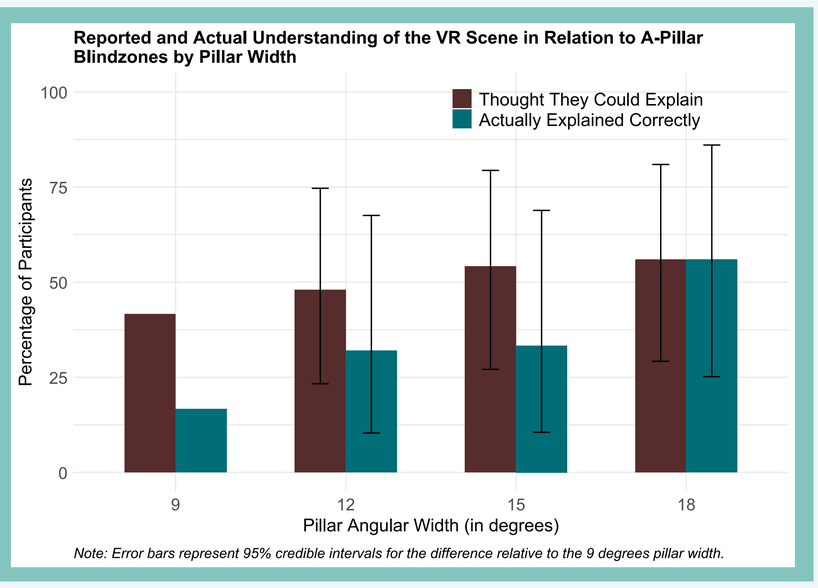
Magic Surprise Rating Task

Q: "How surprising do you feel the appearance of the coin was on a scale of 0 to 10?"

Results / Conclusions

1. Surprise ratings are high for all pillar widths.
2. Surprise ratings are slightly less for the widest pillar width as compared to the narrow ones.
3. The average VR surprise rating is higher than the average surprise rating for the magic trick, which is 6.94.
4. Less than half of the participants were able to figure out what had actually happened.
5. The understanding was better with the broader pillars.





References:
Ekroll et al. (2017). The other side of magic: The psychology of perceiving hidden things. *Perspect. Psychol. Sci.*
Ekroll et al. (2021). The illusion of absence: How a common feature of magic shows can explain a class of road accidents. *CRPI*.
Forster et al. (2025). The illusory perception of occluded space as empty depends on the occluded area. https://doi.org/10.31219/osf.io/b8puj_v1
Øhrn et al. (2019). A Perceptual illusion of empty space can create a perceptual illusion of levitation. *i-Percept*.

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