

How do infants segment scenes?

Can repetition of a novel object on variable backgrounds lead to segmentation?

Background

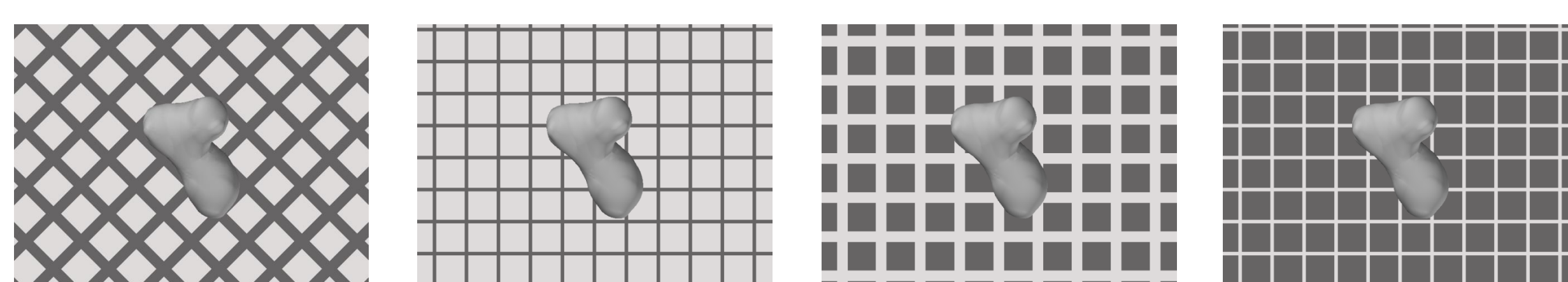
Evidence for novel object segmentation



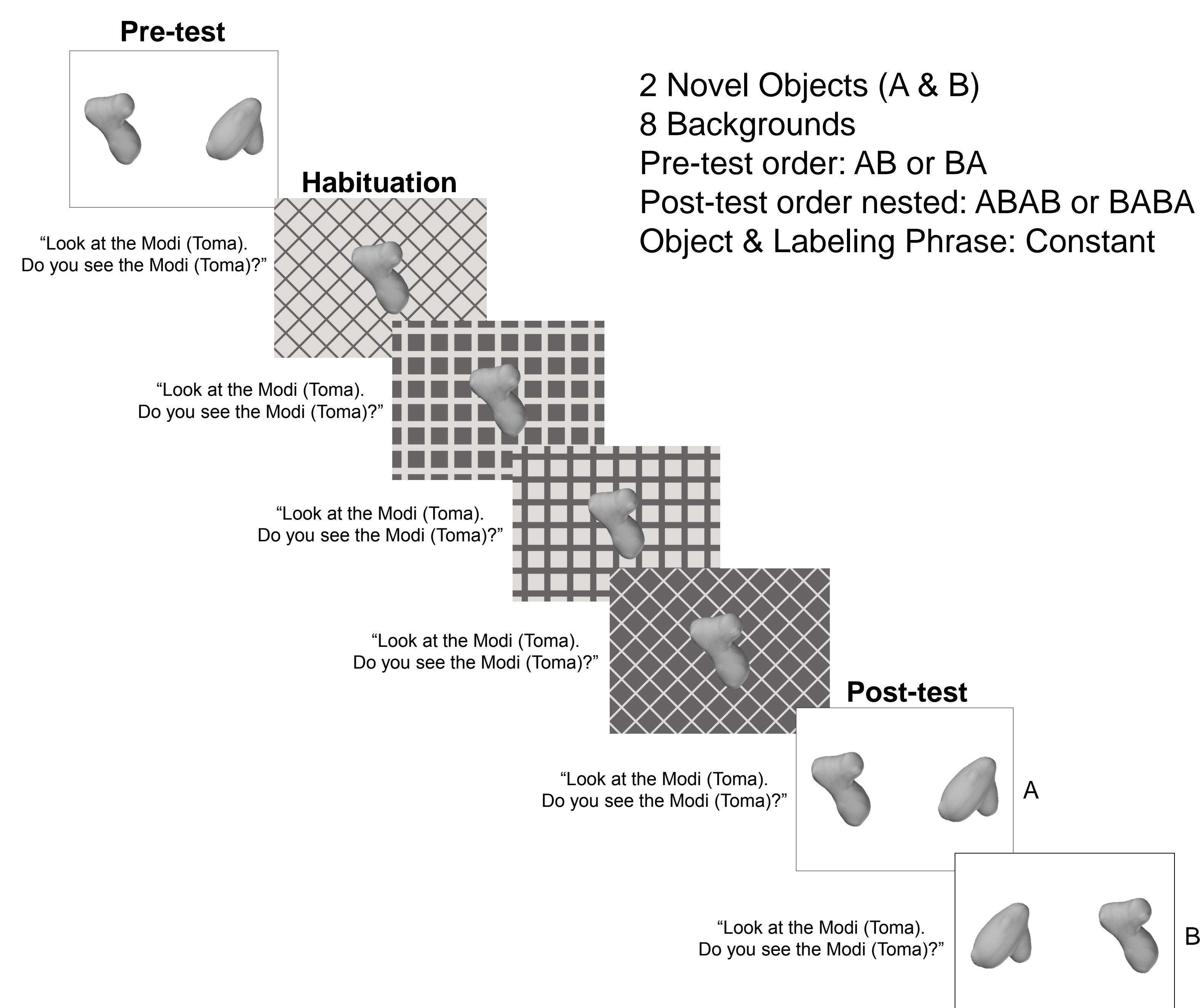
Some adults can learn to recognize a novel object when:

Viewed repeatedly against variable static backgrounds
Texture and shading of object and background identical ¹

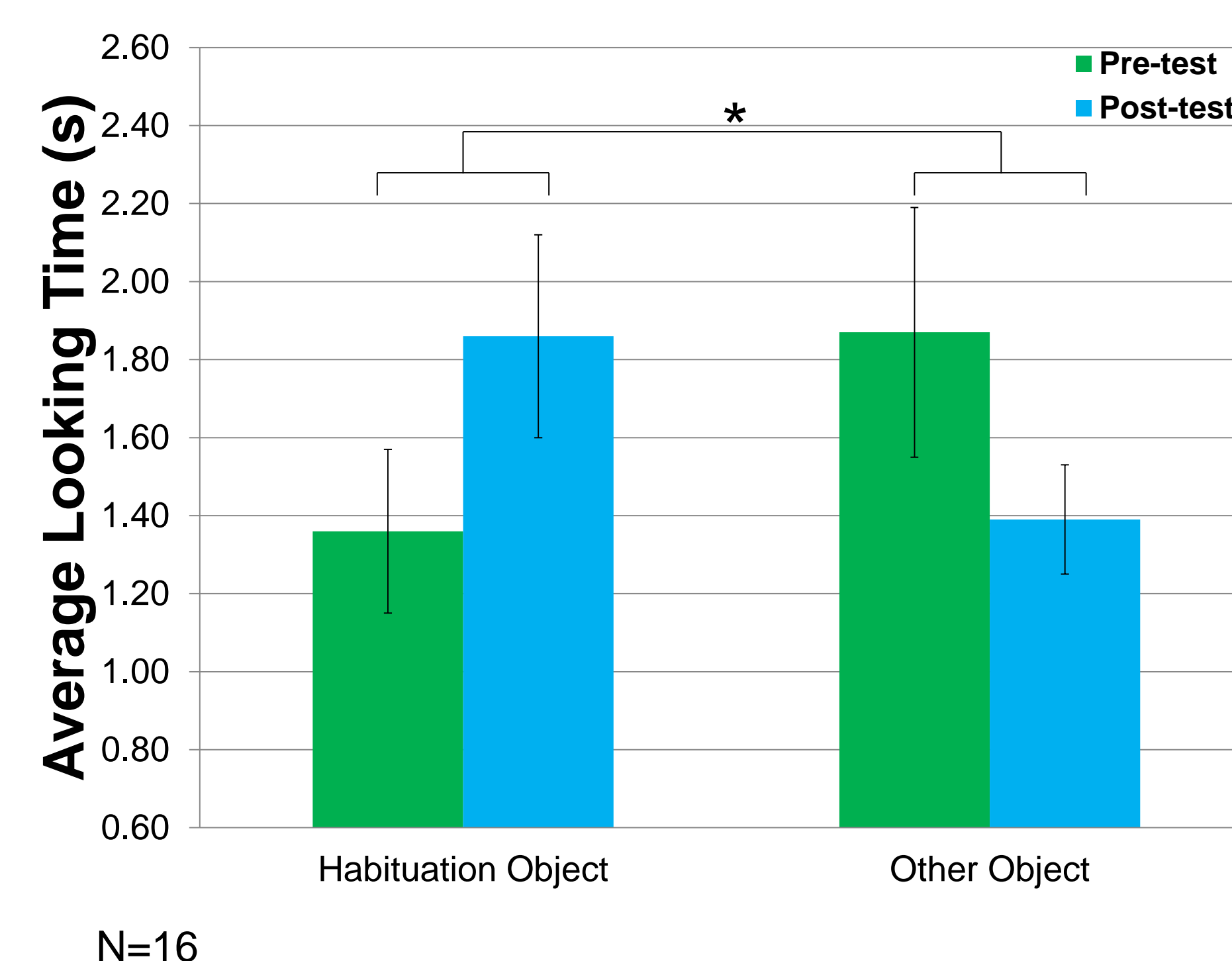
Stimuli & Schematic



Habituation Paradigm with Looking Times



3D novel objects & variable 2D backgrounds



Segmentation?
YES

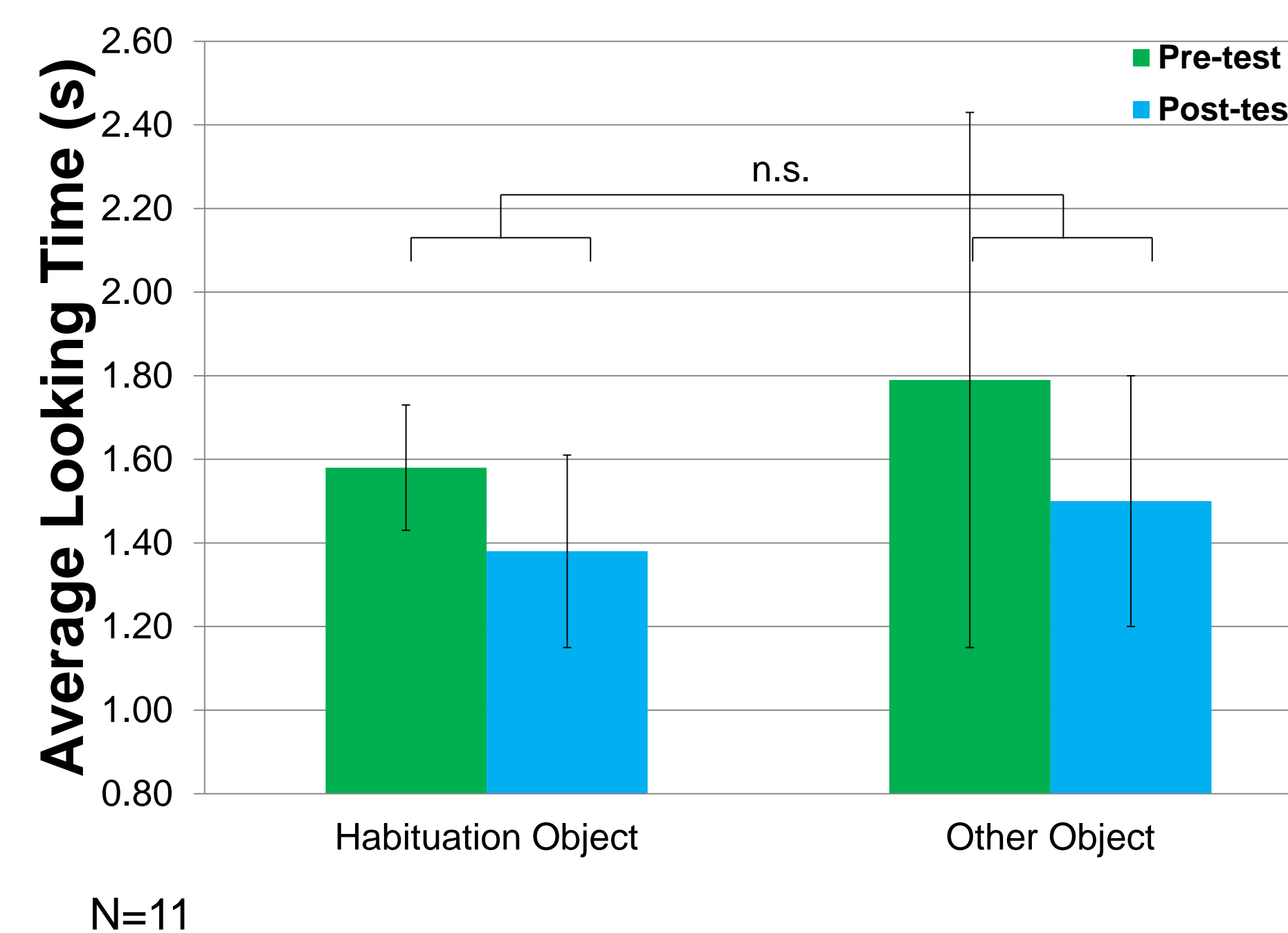
Recognition, therefore Segmentation when:
2D backgrounds change across trials

But is a variable background necessary?

Or do shading & interposition support segmentation?
7mos but not 5mos sensitive to these depth cues ^{2,3,4}

Experiment 2

3D novel objects & constant 2D background



Segmentation?
NO

No Recognition/Segmentation when:
2D Background constant across trials

Conclusions

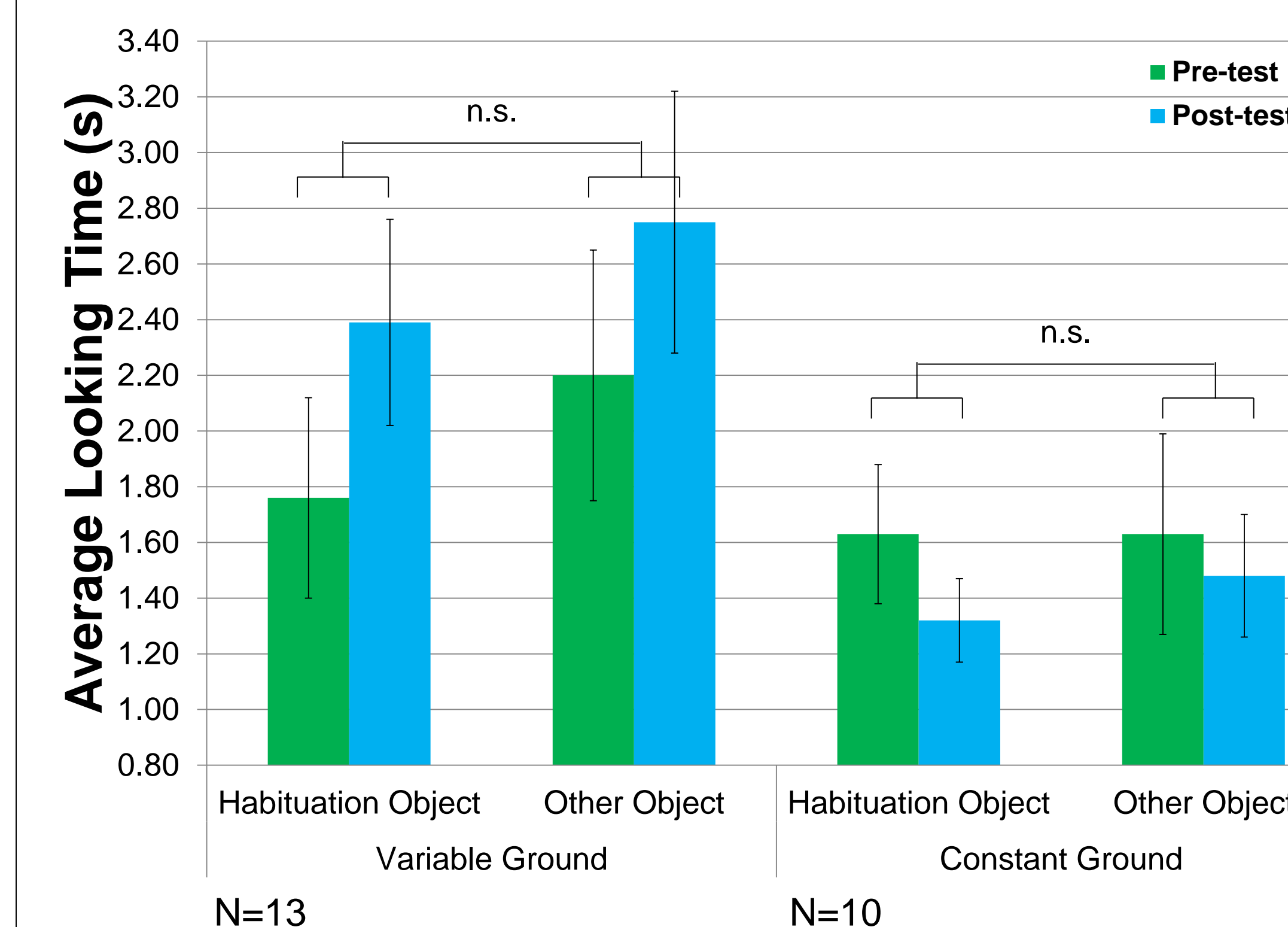
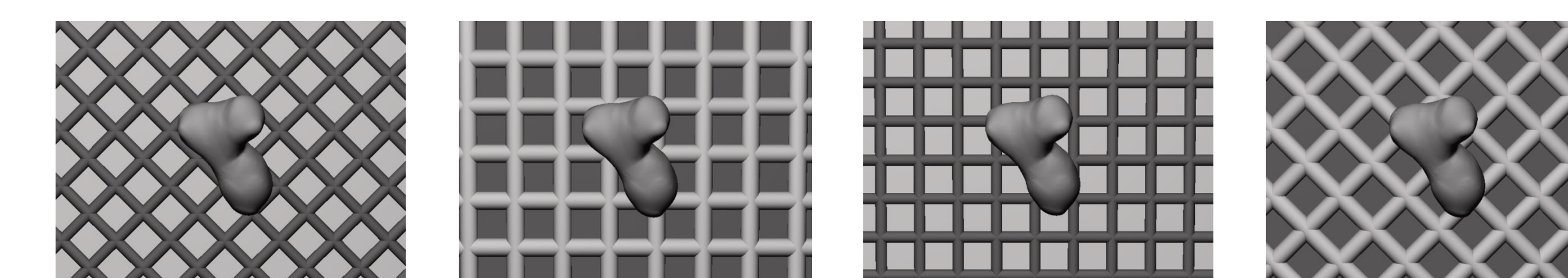
5.5mos can use object repetition to segment *only*
when ground varies & not when ground constant

Emergence of past experience cue
mere repetition of object on changing
ground leads to segmentation

First demonstration that infants can use this cue
Unlike adults they use this cue without explicit
instruction and in a single learning experience

Experiment in progress

Does repetition of 3D object on variable
3D backgrounds support segmentation?



Segmentation?
NO

BUT!
Displays dimmer
Eliminated > 2x N as in
previous Experiments for
fussiness & Failure to
habituate

No conclusions possible regarding 3D backgrounds

References

- 1) Brady, MJ & Kersten, D (2003). Bootstrapped learning of novel objects. *Journal of Vision*, 3, 413-422.
- 2) Granrud, CE & Yonas A (1984). Infants' Perception of Pictorially Specified Interposition. *Journal of Experimental Child Psychology*, 37, 500-511.
- 3) Granrud, EC, Yonas A & Opland EA (1985). Infants' sensitivity to the depth cue of shading. *Perception & Psychophysics*, 37, 415-429.
- 4) Imura, T, Yamaguchi, MK, Kanazawa, S, Shirai, N, Otsuka, Y, Tomonaga, M & Yagi, A (2008). Infants' sensitivity to shading and line junctions. *Vision Research*, 48, 1420-1426.

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