gaze-following and recognizing intentions from gaze

Outline

- infant gaze following studies and intentionality
- gaze following and object processing

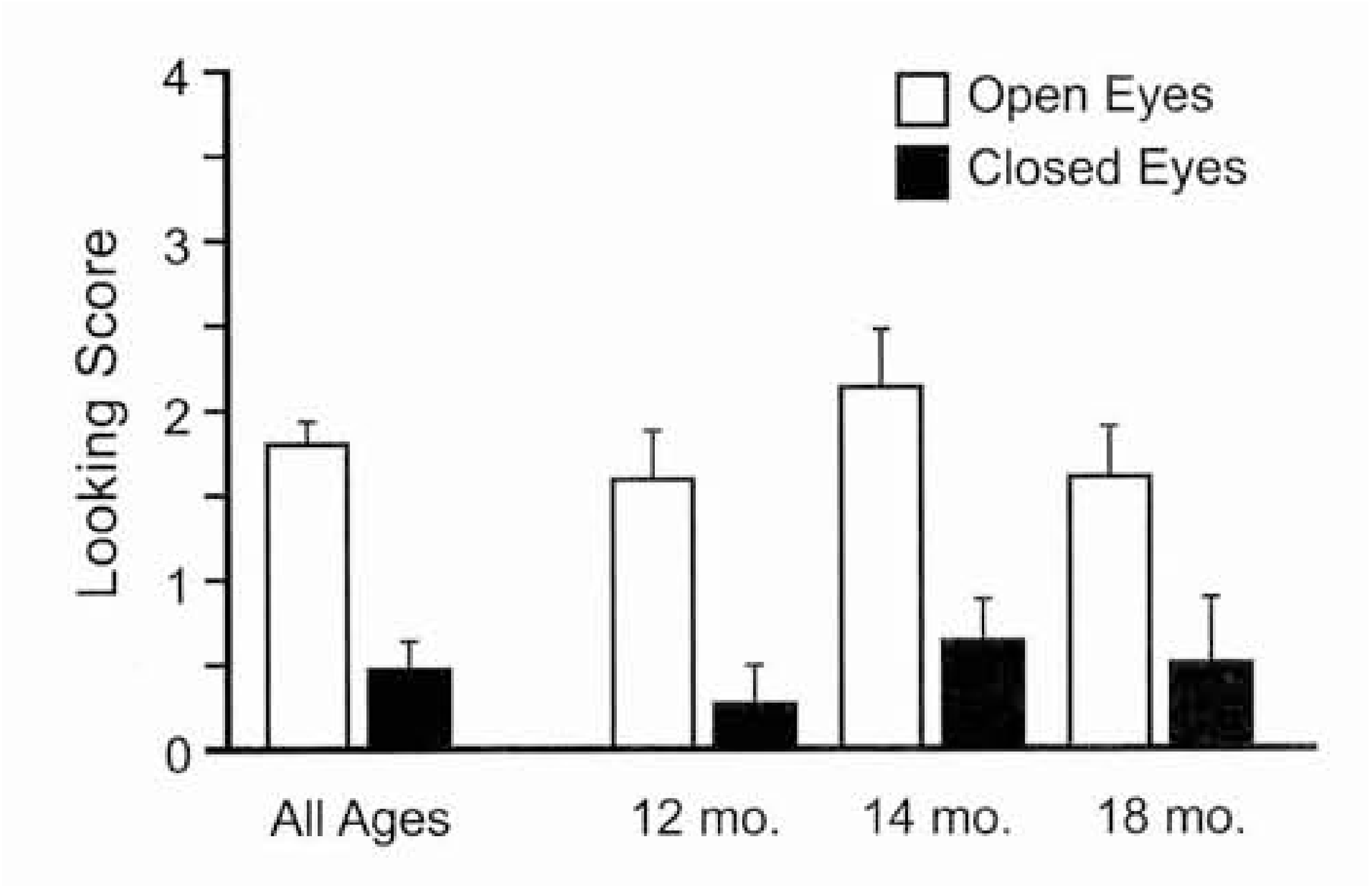
Do infants gaze-follow?

- Infants turn in the direction that an adult has turned.
- What is the mechanism underlying this behavior?
  - The infant notices the **head motion** and swings her head to the correct half of space without processing adults gaze to an object
  - The infant follow the **gaze** and has an understanding about the relationship between the

eyes open/closed experiment

- 12, 14, 18 month old infants
- between subject design
- conditions: adult's closed or open eye
- Infant's first target look was categorized as "correct look" (+1) if it aligned with adult's target and as "incorrect look" (-1) if it didn't.

main results



other findings

- infants inspected the target longer in open-eyes condition.
- more infants vocalized toward the correct target in the open-eyes than closed-eyes condition.
- significantly more infants pointed to the targets in open-eyes that closed-eyes condition. (interpreted as evidence of “proto-declarative” pointing)

Is closed-eyes condition disruptive?

- The adult's eyes were shut only slightly longer than the blink of an eye (half a second) before the turning toward the object for a 6.5 s response period.
- no detectable difference in the emotional reactions as a function of condition
- The duration measures the length of looking after the infant has turned to the correct target.
- Infants show other target-directed acts (pointing at the target and vocalizing toward it) when the adult can see the target.

When does this begin?

- The same procedure was used for 9 to 11 month old infants.

What could the results for 9-month-old mean?

- they are limited to tracking adult's head movements and run into object by chance. (Butterworth)

- They are conditioned to the head movements as a signal for seeing an object on the periphery. (Moore)
- They are body-orientation followers. (Melrzoff's "Like Me" hypothesis) body

biological vs physical occluders

- 12, 14, 18 month old infants
- conditions : headband, blindfold
- 14 and 18 month old infants looked at the adult's target significantly more often in the headband than in the blindfold condition.
- The 12 month old didn't distinguish between conditions.

intervention experiment

- Infants randomly assigned to a baseline condition, or two treatment groups : blindfolds, and the same cloth with an opening cut in the middle of it.
- The blindfold group experienced that the blindfold blocks their view.
- Those infants now interpreted the blindfold correctly. (like-me hypothesis?)

Does gaze-following behavior at 10-11 months predict later language development?

- Infants who produced the correct gaze and simultaneous vocalization act at 10-11 months had larger receptive vocabulary at 18 months.
- They also built significantly more complex sentences and had larger productive vocabulary at 24 months.

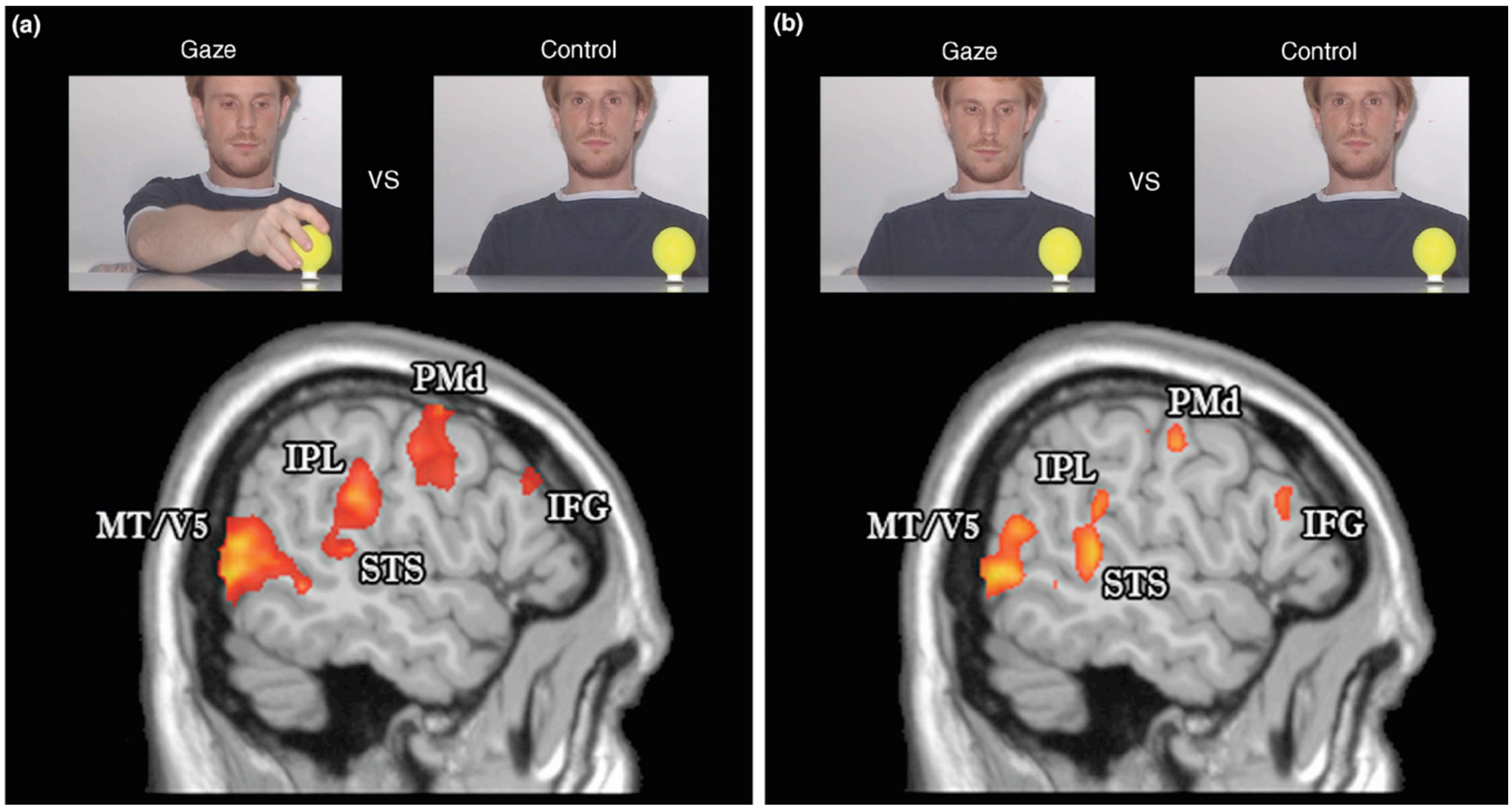
summary

- Gaze following happens in 10-11th month of infants development.
- Infants come to understand nonbiological occluders to vision sometime around or soon after 1 year of age depending upon the nature of the occluder.
- Gaze-following behavior at 10-11 months predicts later language development.

gaze following and object processing

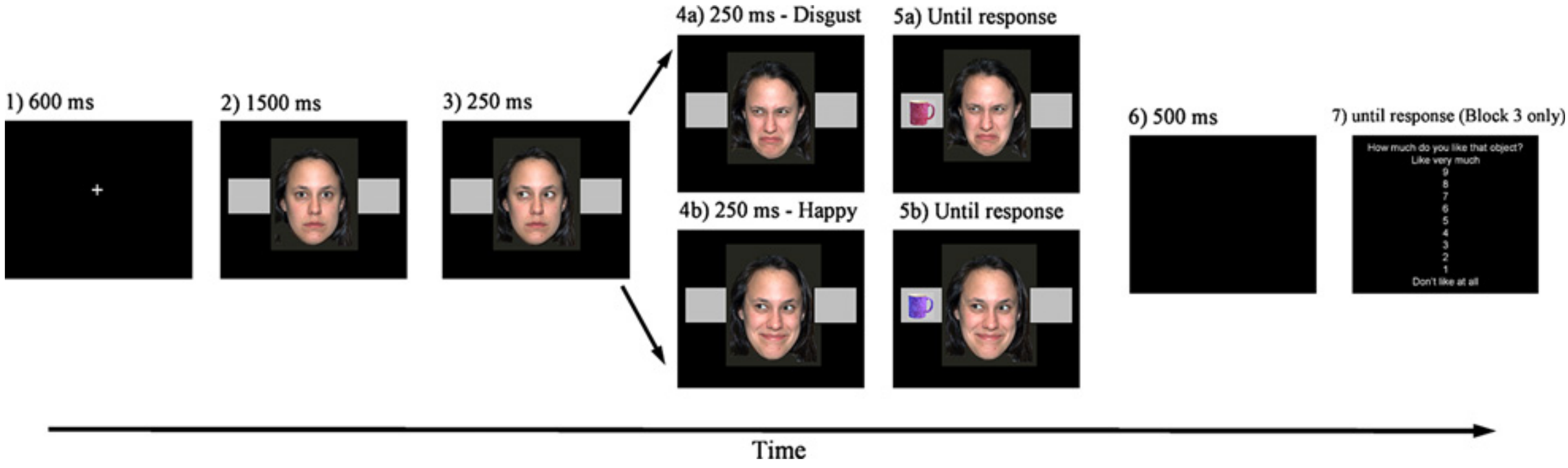
- From gaze of others we get information about both ‘inside’ and ‘outside’. (e.g. intentions and mental state vs information about relevant events in the environment)
- Is it possible to integrate the two groups?
  - object properties

motor properties

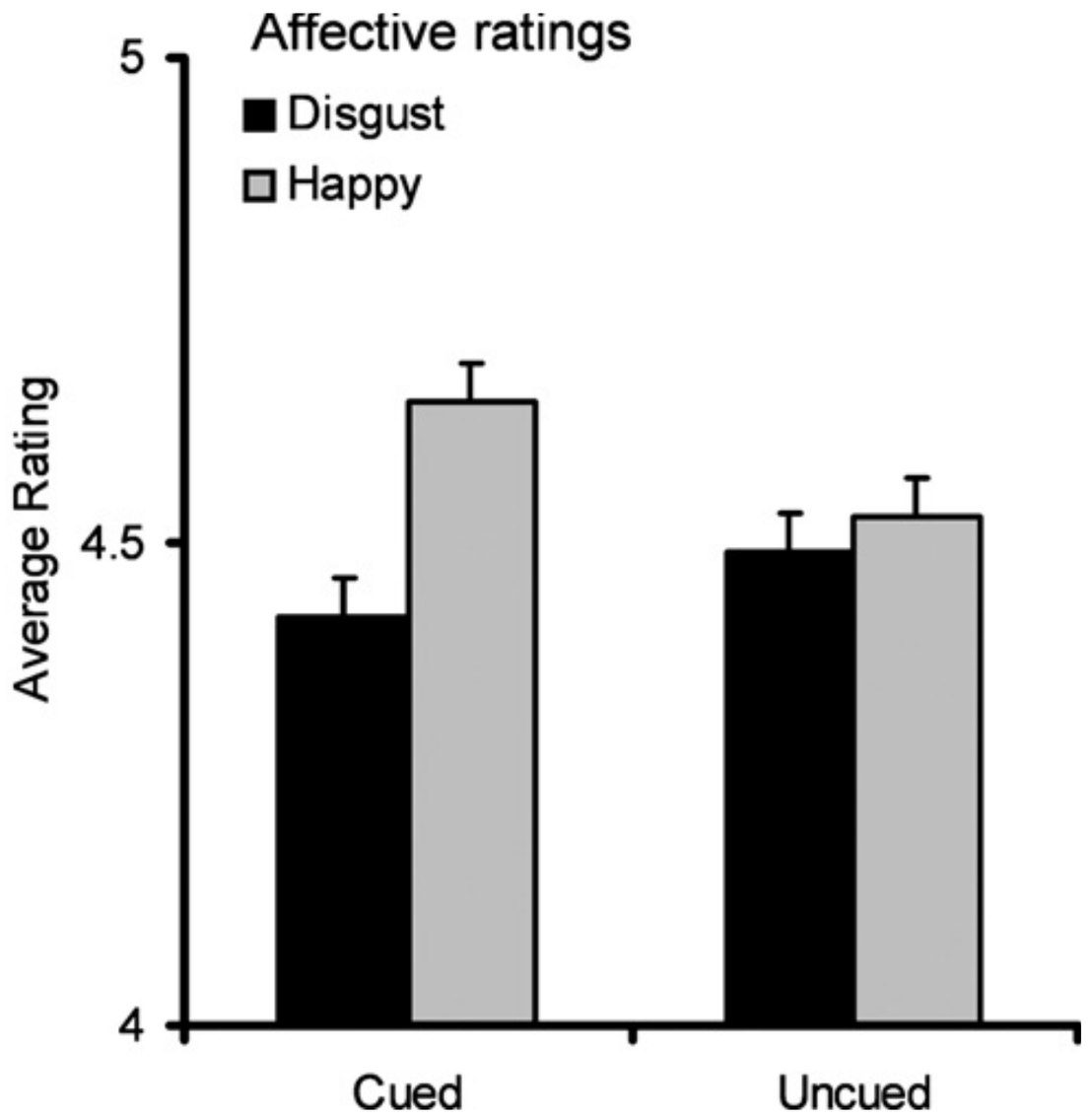


emotional properties

- Do we prefer objects that are looked at by other people?



emotional properties



status properties

- Does an object looked at by others look more familiar?

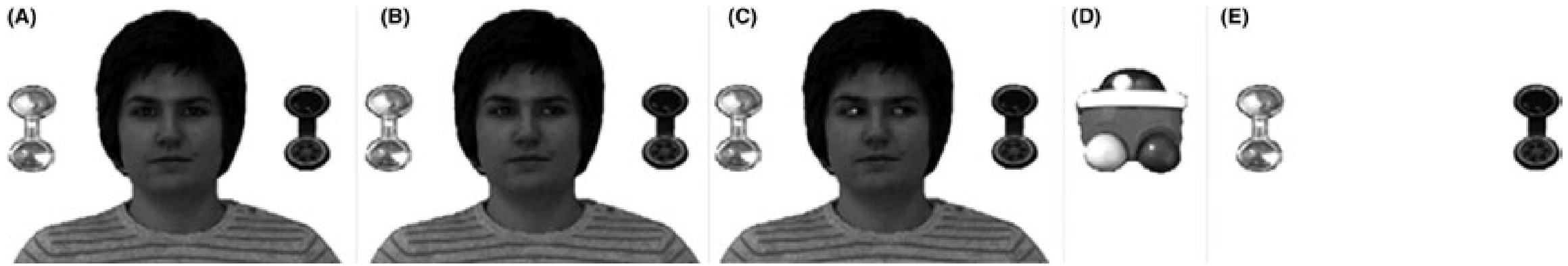
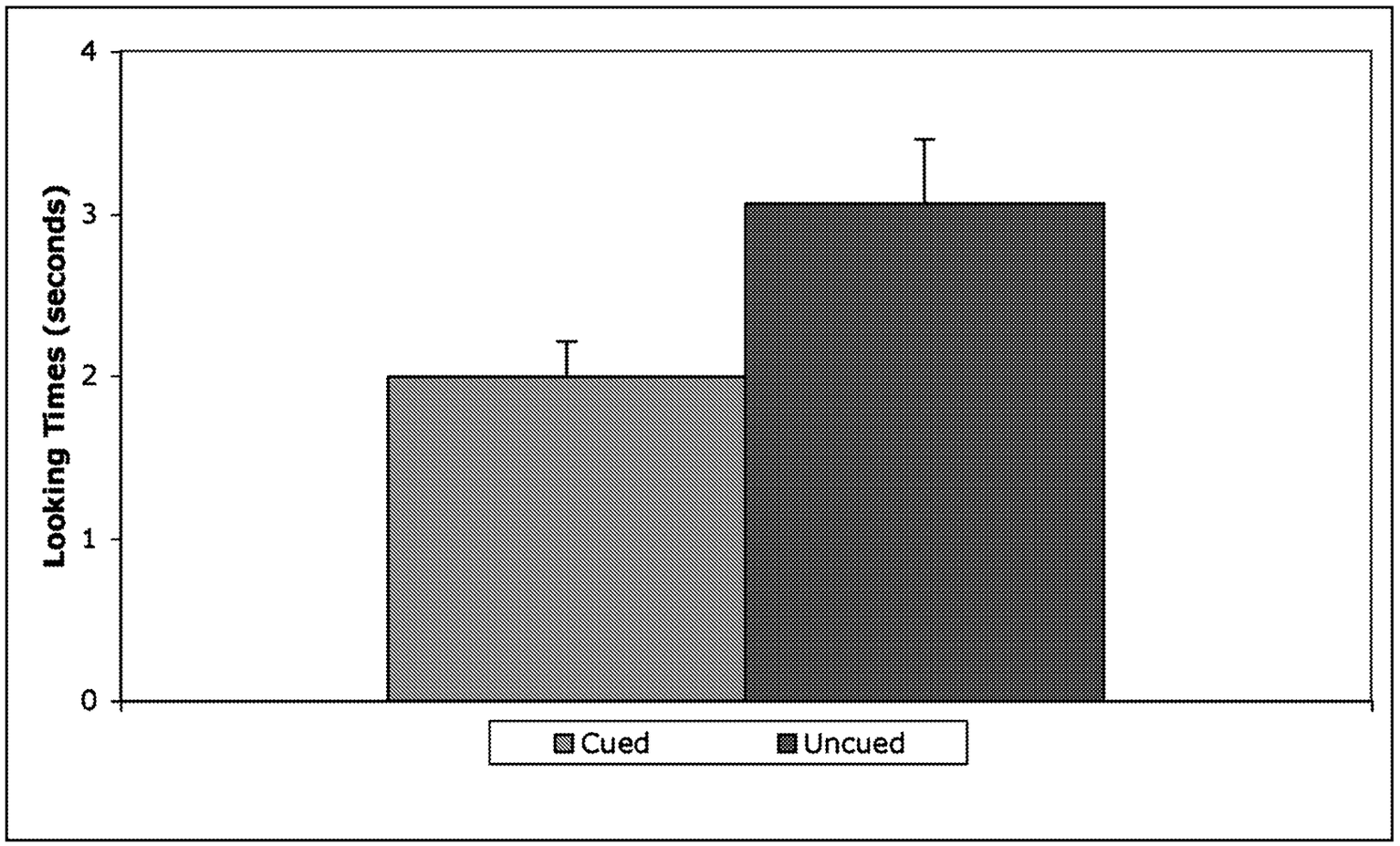


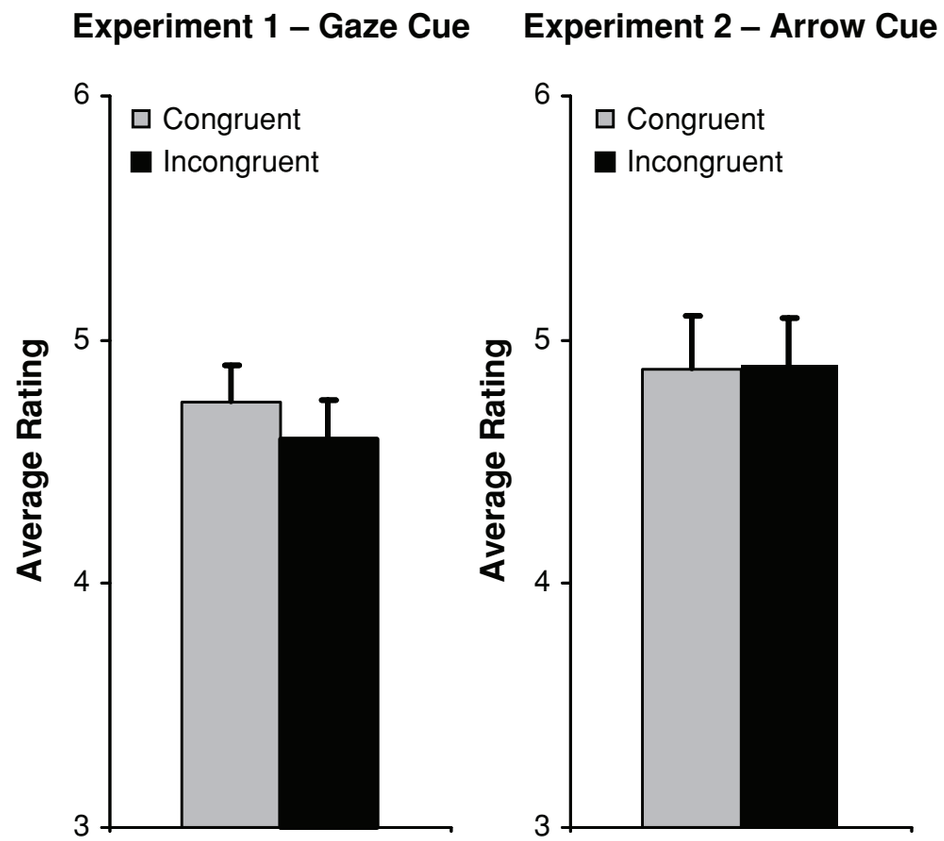
FIG. 1. Schematic of stimuli. (A) Direct gaze; (B) eye movement (C) final gaze; (D) central attractor and (E) presentation of two objects.

status properties



beyond an attentional shift

- experiments with symbolic cues, like arrows, do not guarantee a consequence on object processing. (e.g. no modulation observed in affective response to objects using arrow cues)



beyond an attentional shift

- Non-intentional gaze does not produce the same effects :
  - fixating on the target and not looking at a distractor
  - looking away

beyond an attentional shift

- The properties discussed seem to persist even when the gaze of others is no longer visible.

Summary

- Studies discussed suggest that gaze of others modifies properties of objects and influences object processing:
  - object gazed at become graspable, attractive and familiar.
  - These properties are likely to be a product of intentionality of the gaze.

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Questions?