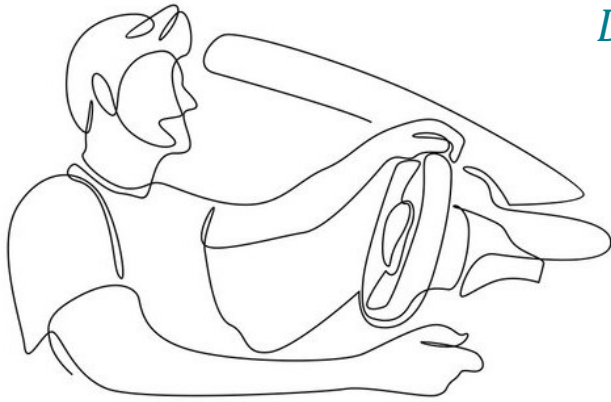
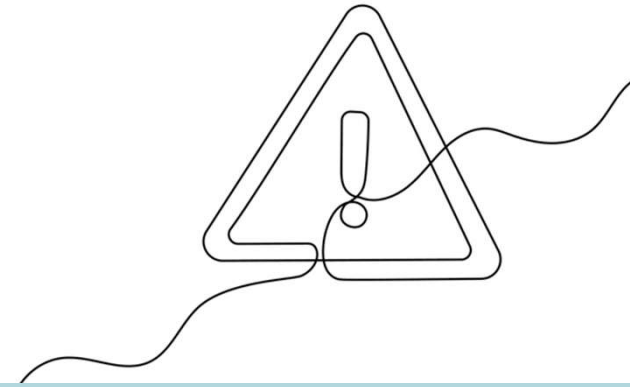




Driver Distraction and Inattention (DDI2026)

October 20th, 2026



Reducing inattentional blindness to warning signals: the influence of meaning, emotional value, and task context

Katarina Pavic, Barbara Vieira Ribeiro & Laetitia Silvert

Camera Monitoring Systems (CMS)



DOLPHIN

Development Original truck lab for Physical Integration

V O L V O



Camera Monitoring Systems (CMS)



DOLPHIN

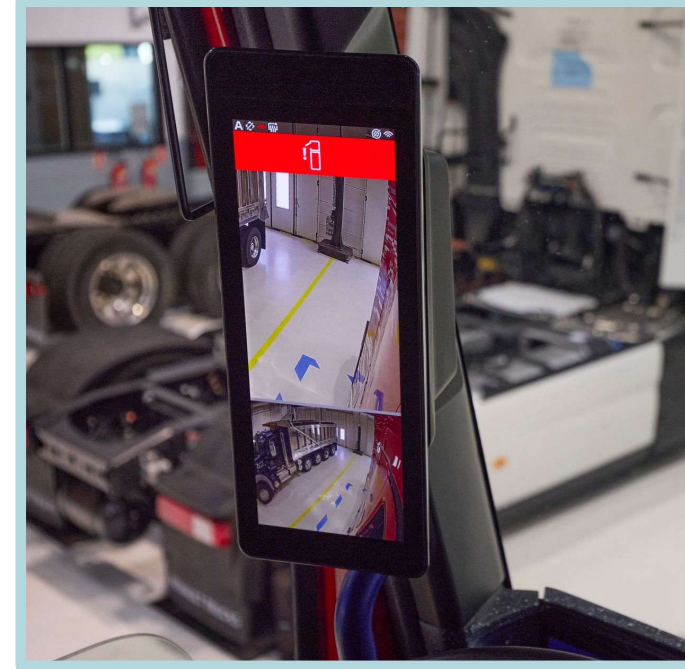
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Camera Monitoring Systems (CMS)

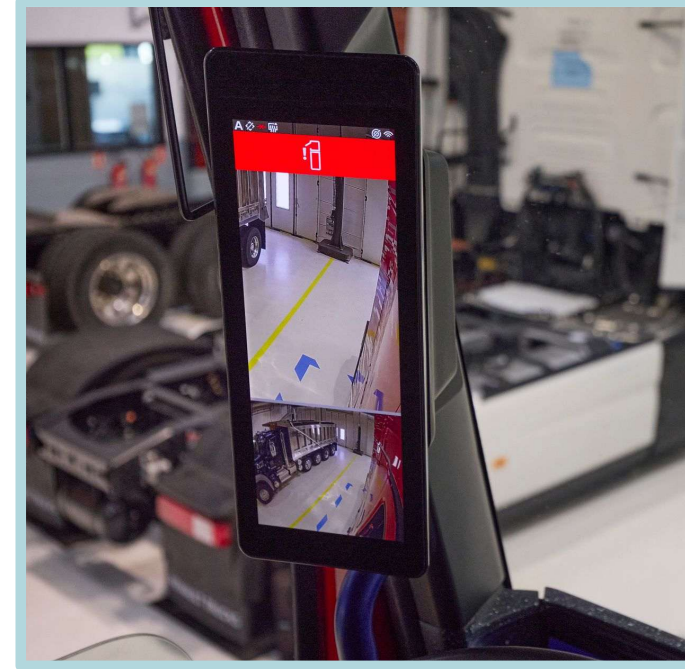
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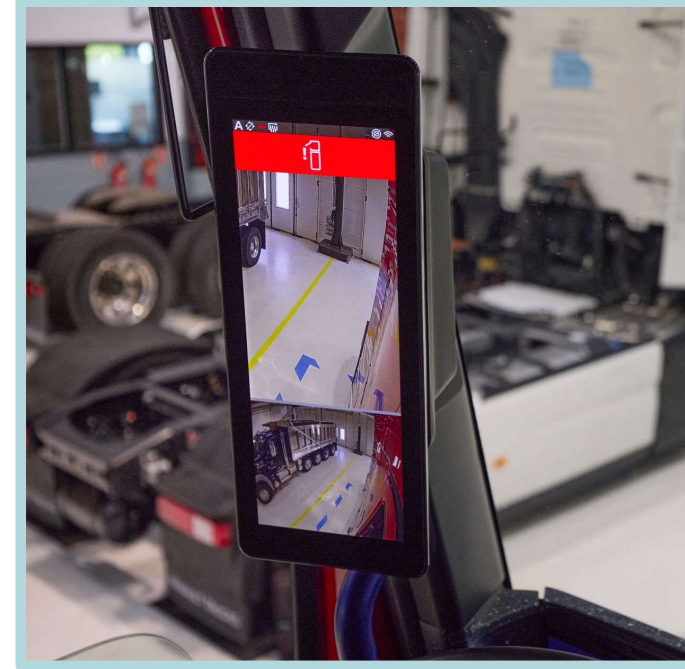
- ⇒ Increased perceptual load, leaving fewer resources to process unexpected events.
- ⇒ Greater vulnerability to inattention blindness.
(*Hutchinson et al., 2022; Matias et al., 2022*)



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Major concern for road safety

- ⇒ Crucial to identify which factors may **reduce inattention blindness** to warning signals.

Inattentional blindness (IB)

⇒ Failure to consciously perceive a visible but unexpected stimulus while attention is engaged elsewhere.

(Mack & Rock, 1998)

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Which factors can reduce IB?

Characteristics of the
unexpected stimulus

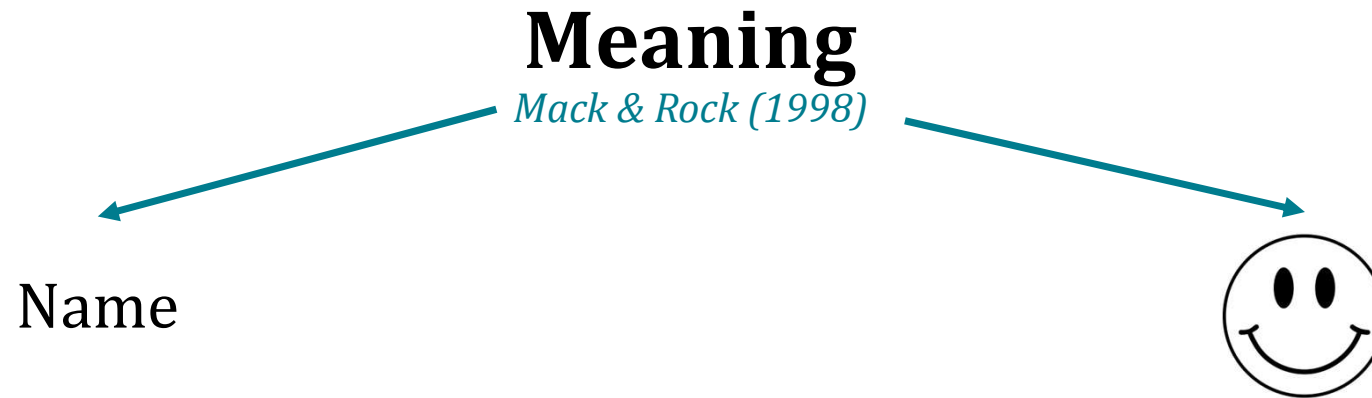
Attentional set

Stimulus characteristics influencing IB

Meaning

Mack & Rock (1998)

Stimulus characteristics influencing IB



Stimulus characteristics influencing IB

Meaning

Mack & Rock (1998)

Name

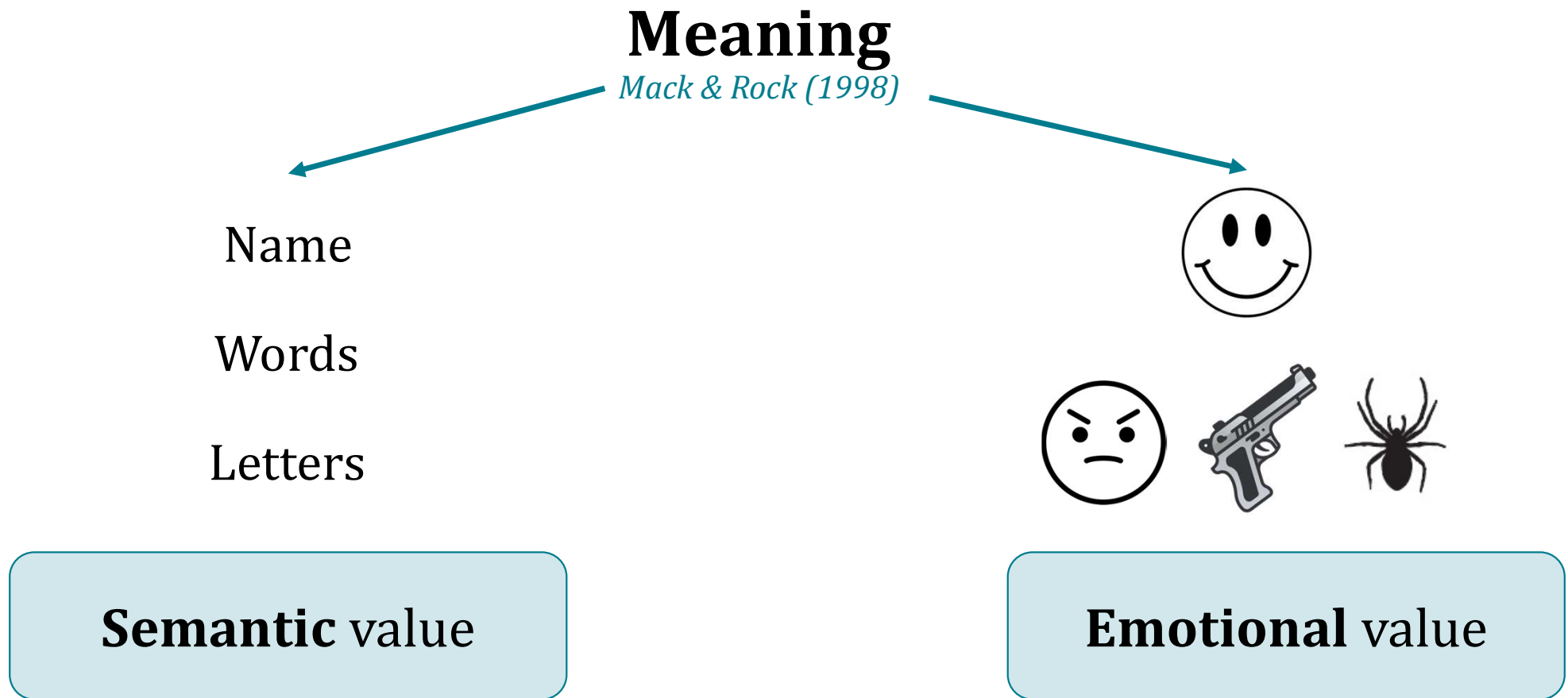
Words

Letters

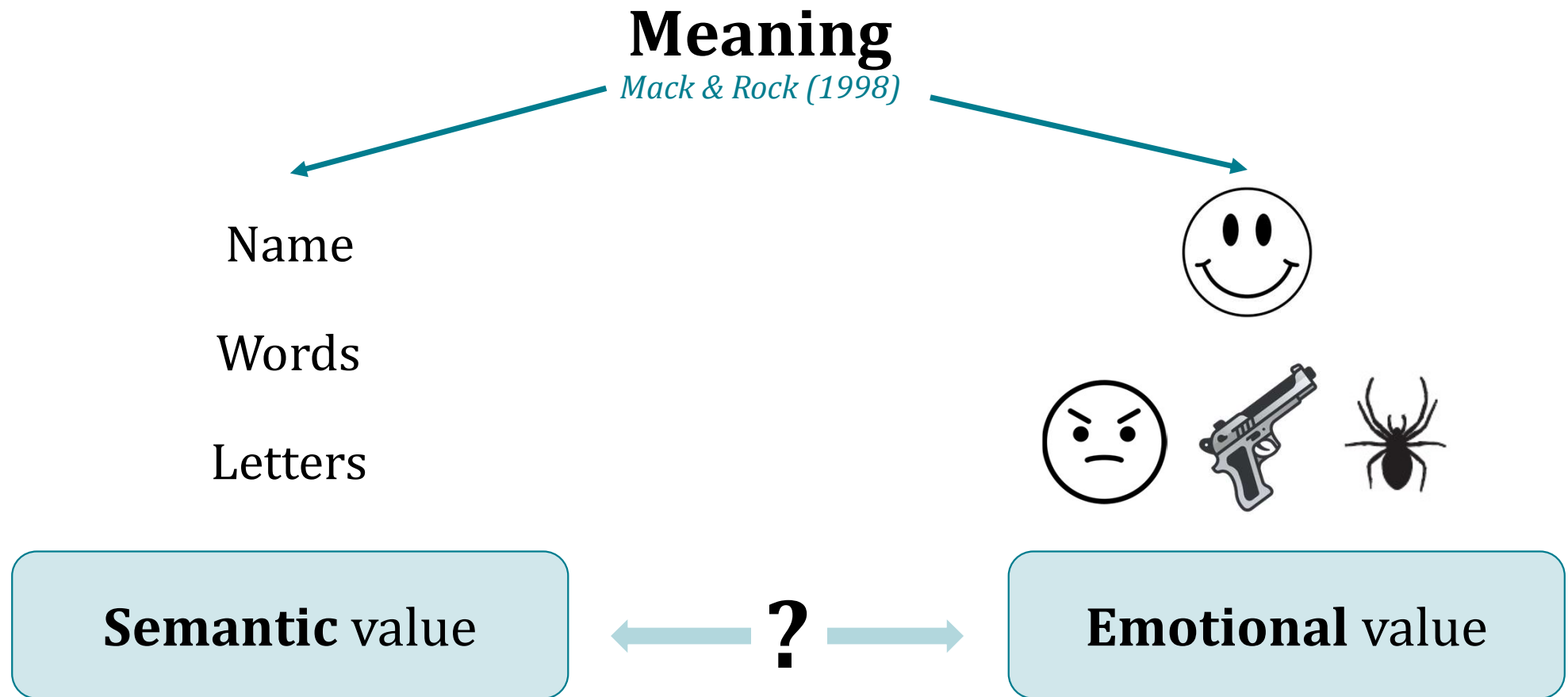


Semantic value

Stimulus characteristics influencing IB



Stimulus characteristics influencing IB



The influence of attentional set on IB

The influence of attentional set on IB

Mental template of the objects or events we expect to encounter

⇒ Unexpected stimuli similar to the primary task targets are more likely to be noticed
(Folk et al., 1992, Most et al., 2005)

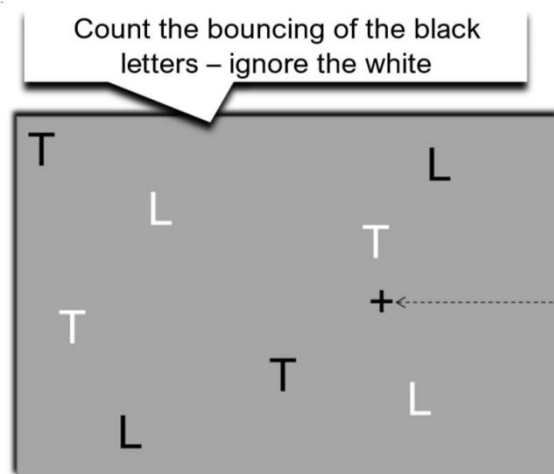
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Simple attentional set

Physical features



(Hutchinson et al., 2022)

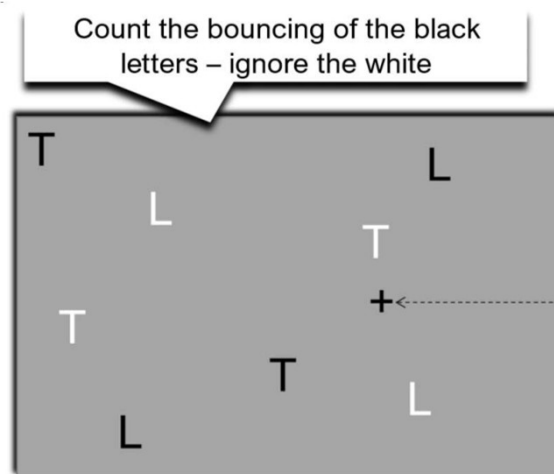
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Complex attentional set

Contextual cues and learned associations

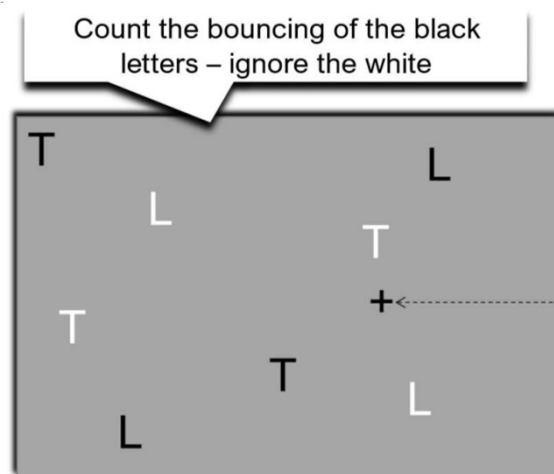
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Contextual cues and learned associations

⇒ Top-down activation

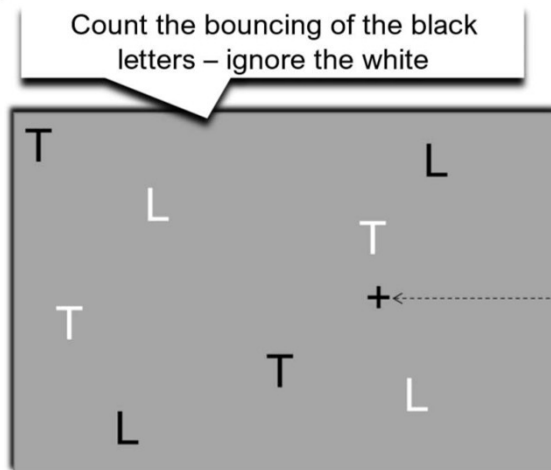
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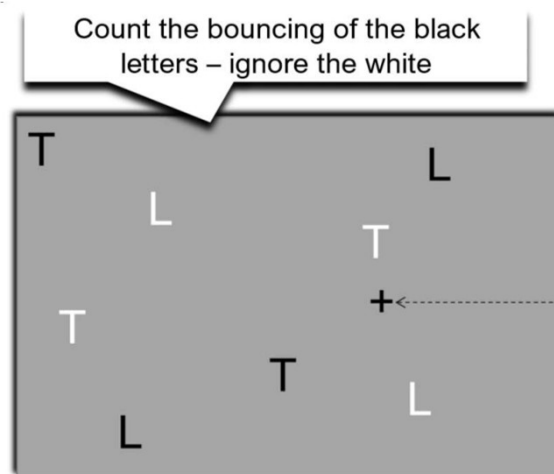
The influence of attentional set on IB

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General method

Aim

Determine how the **semantic** and **emotional** values of unexpected stimuli influence IB depending on **the task context**

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Determine how the **semantic** and **emotional** values of unexpected stimuli influence IB depending on **the task context**

3 online preregistered experimental studies

Total sample: 728 participants

Study 1: 246 participants

Study 2: 243 participants

Study 3: 239 participants



General method

Stimuli



Scramble

Low semantic value &
Low emotional value



Stickman

High semantic value &
Low emotional value



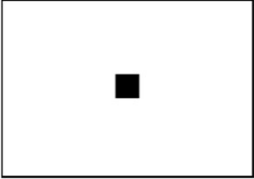
Danger

High semantic value &
High emotional value

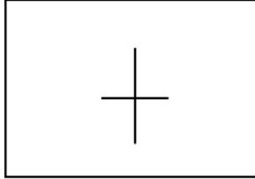
Perceptual, semantic and emotional characteristics were controlled in a pretest (n = 63)

General method

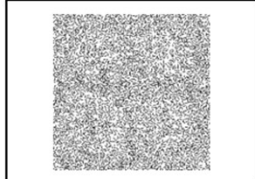
1000 ms



200 ms



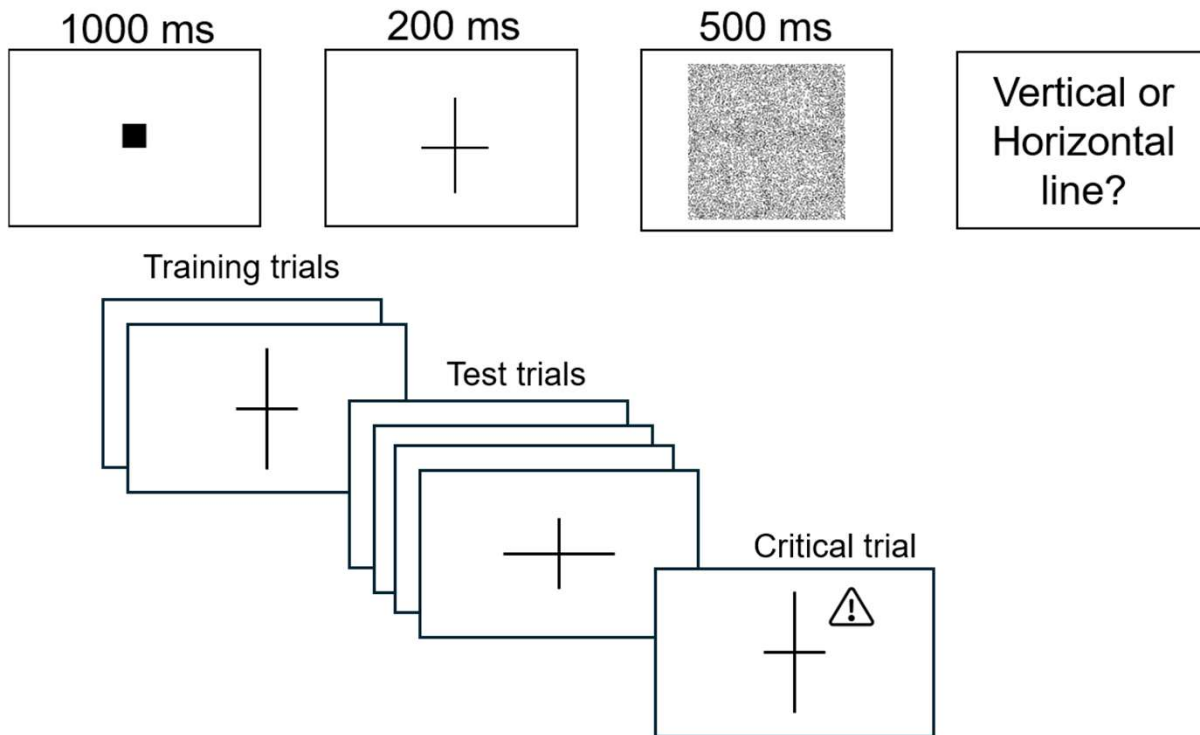
500 ms



Vertical or
Horizontal
line?

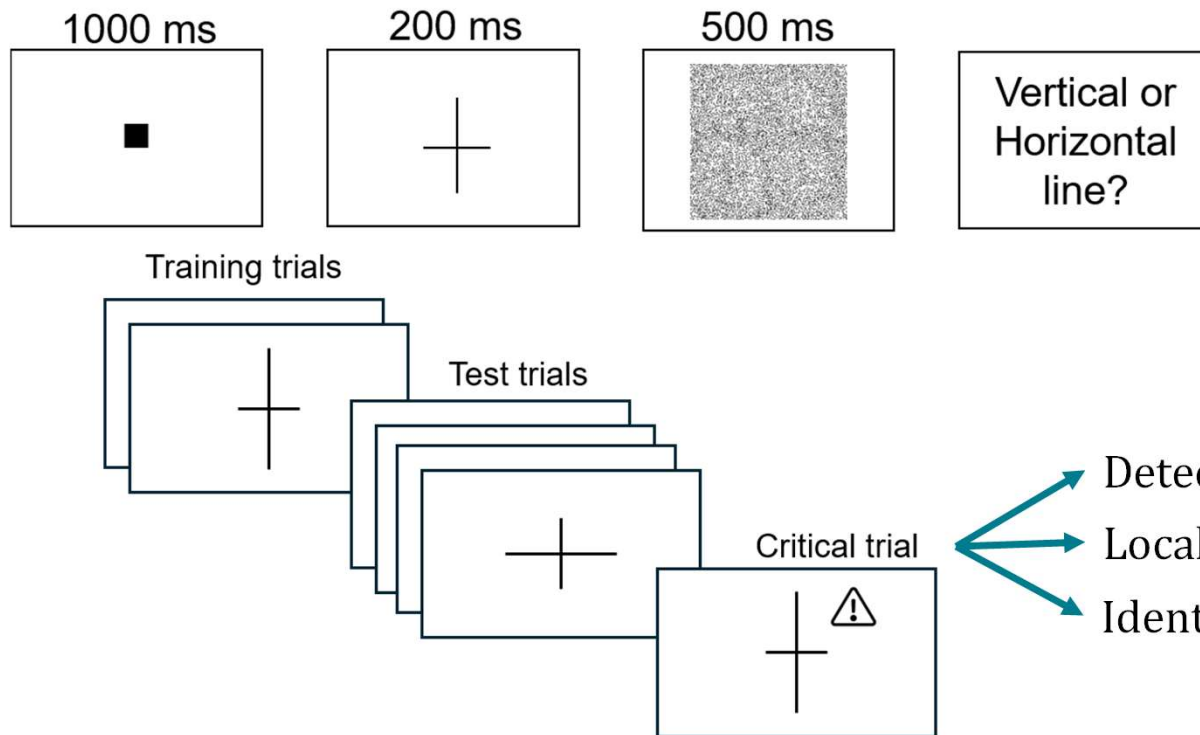
Static IB paradigm
(Newby & Rock, 1998)

General method



Static IB paradigm *(Newby & Rock, 1998)*

General method



Static IB paradigm (Newby & Rock, 1998)

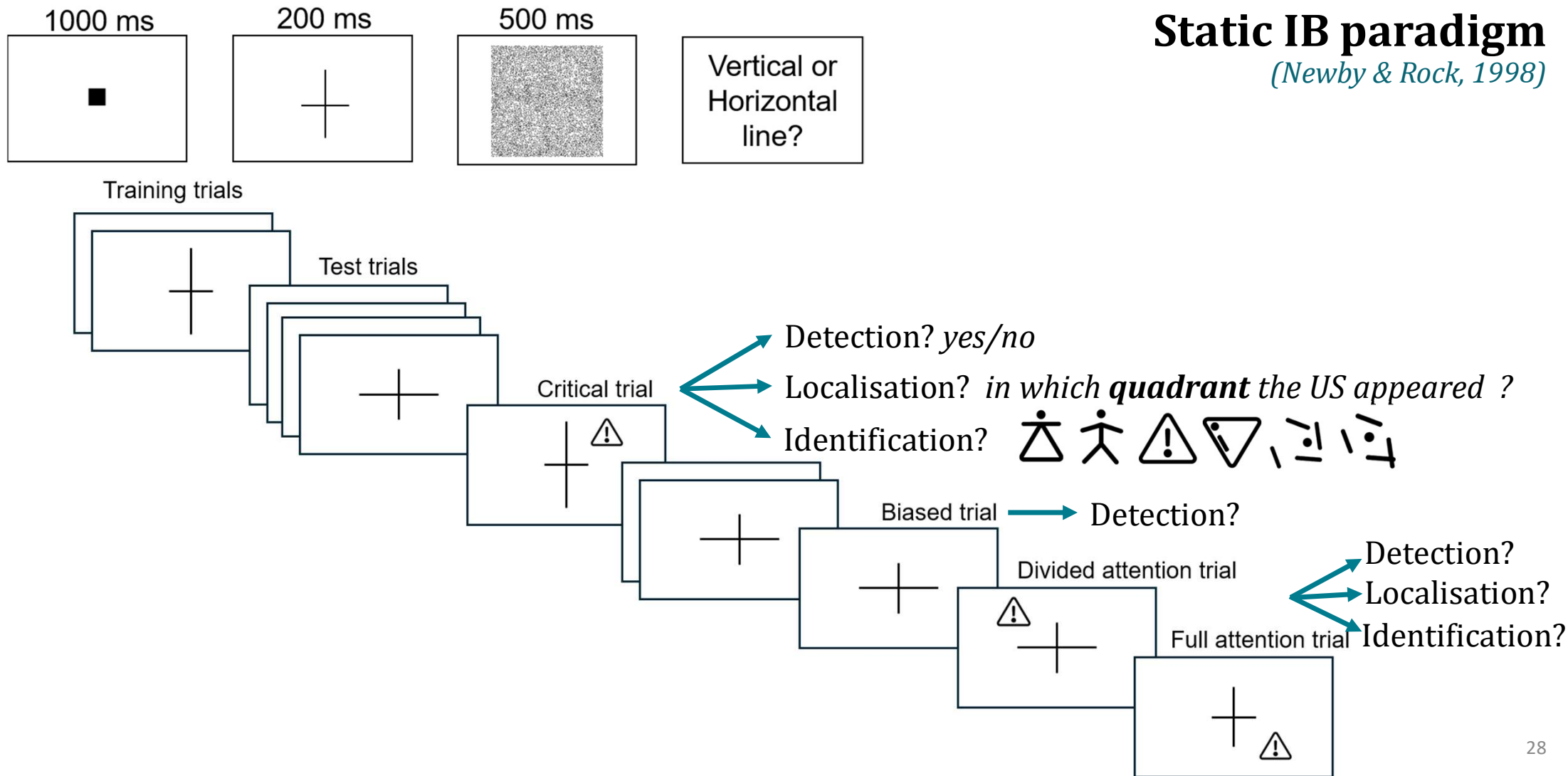
Detection? *yes/no*

Localisation? *in which **quadrant** the US appeared ?*

Identification?

General method

Static IB paradigm (Newby & Rock, 1998)



General method

STUDY 1: Do the semantic and emotional values of visual information influence attentional capture in a “classic” inattention blindness paradigm?

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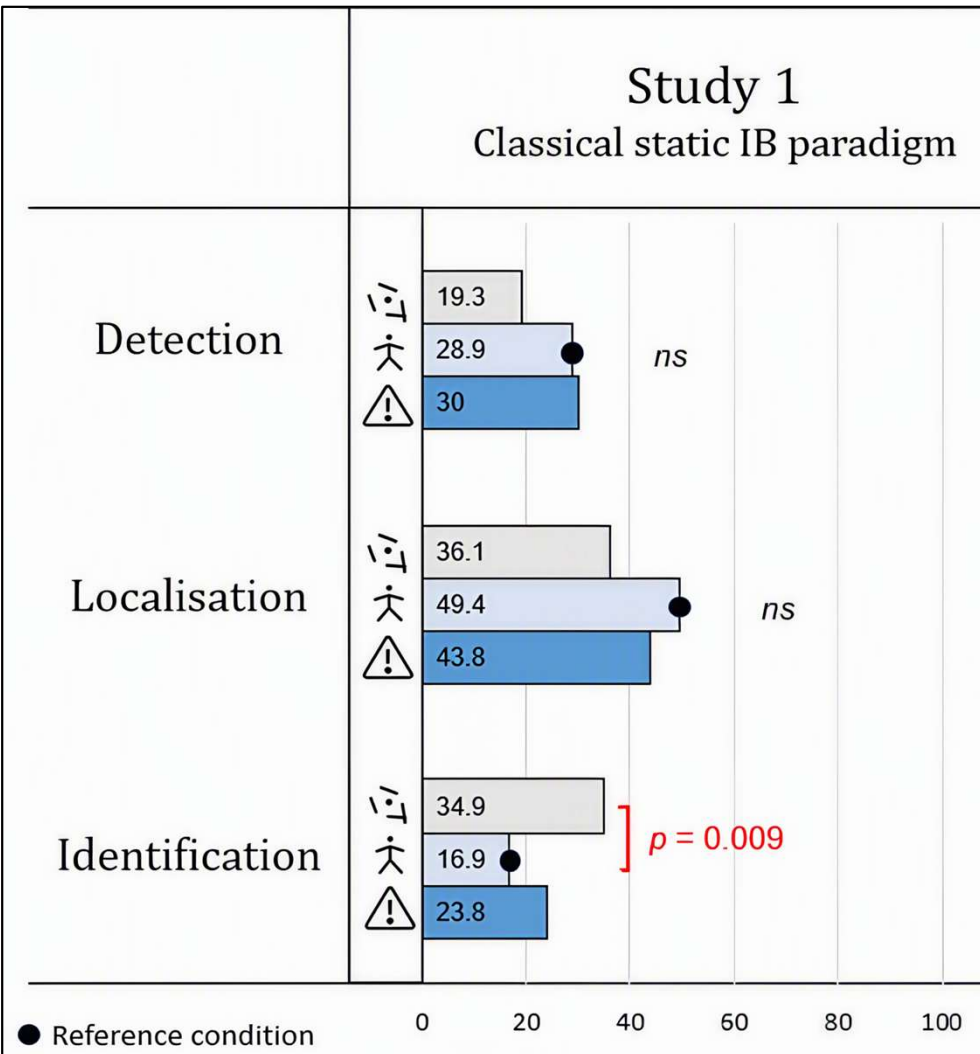
General method

STUDY 1: Do the semantic and emotional values of visual information influence attentional capture in a “classic” inattention blindness paradigm?

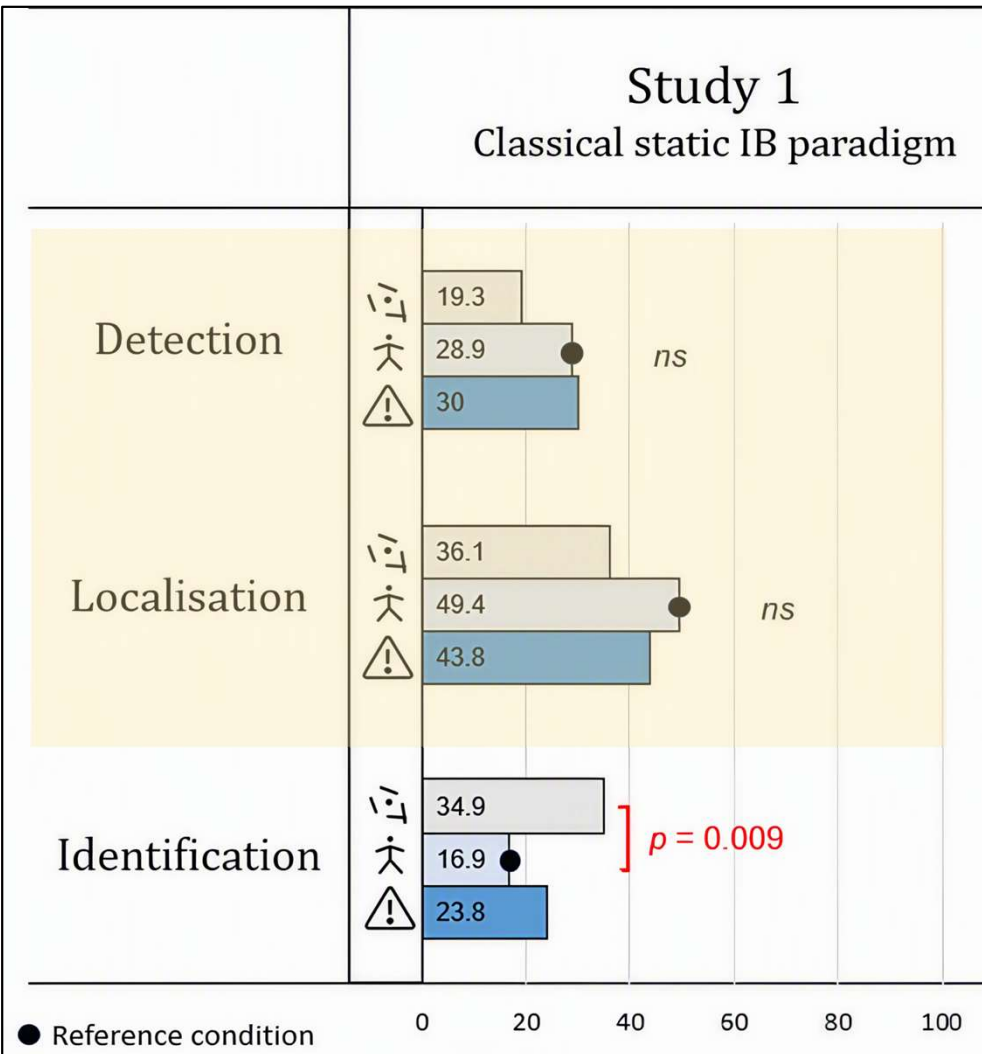
STUDY 2: Does activating a driving context influence inattention blindness to unexpected stimuli with semantic and emotional value?

STUDY 3: Does activating a threatening driving context influence inattention blindness to stimuli with semantic and emotional value?

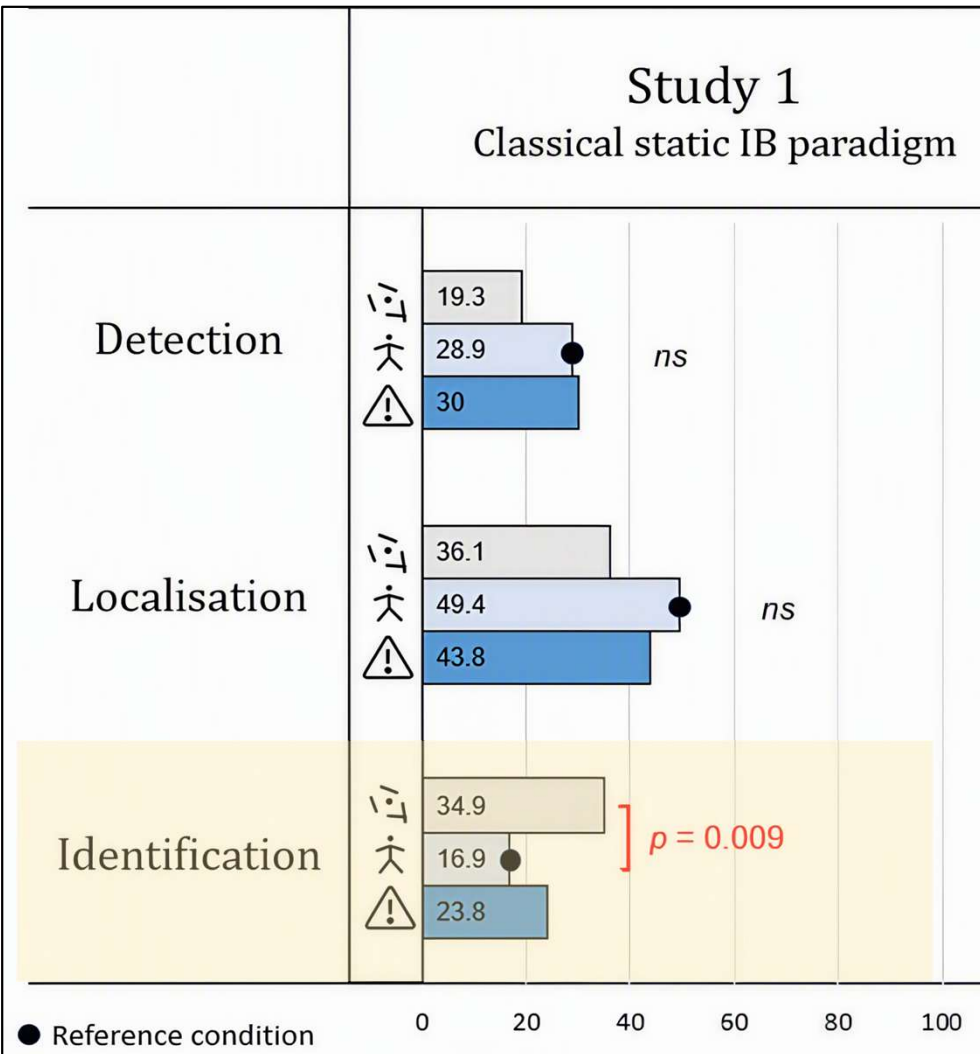
Results – critical trial



Results – critical trial



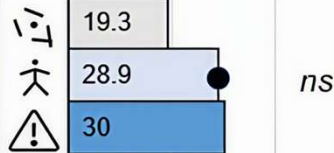
Results – critical trial



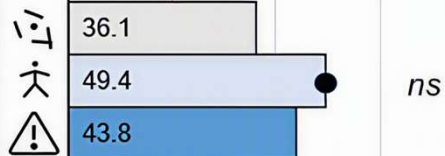
Results – critical trial

Study 1 Classical static IB paradigm

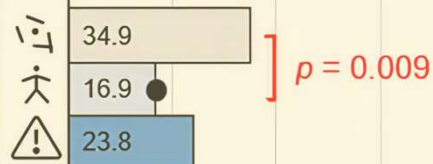
Detection



Localisation



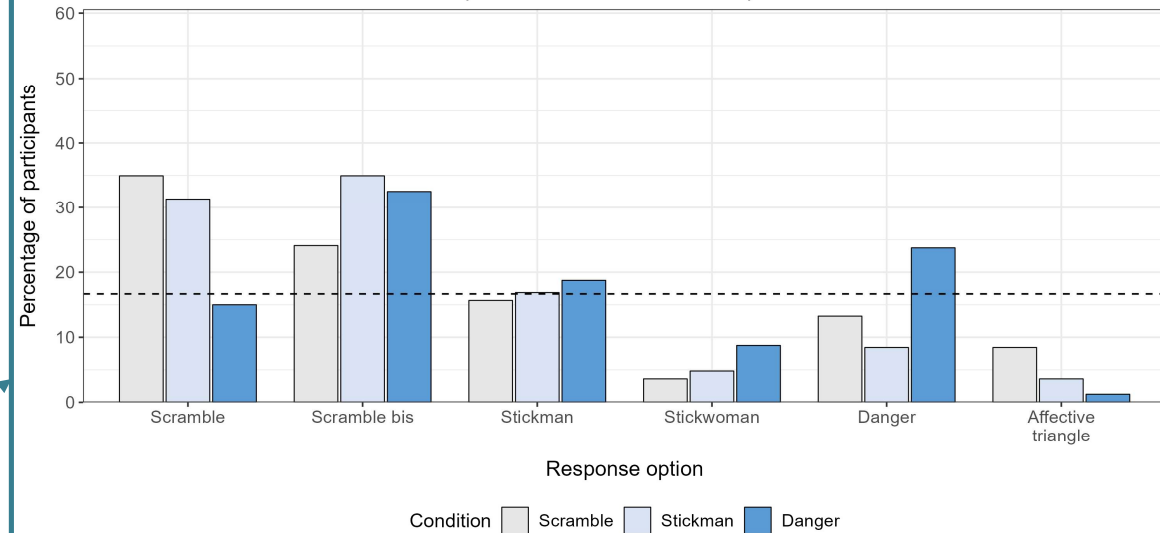
Identification



● Reference condition

0 20 40 60 80 100

Responses to the identification question



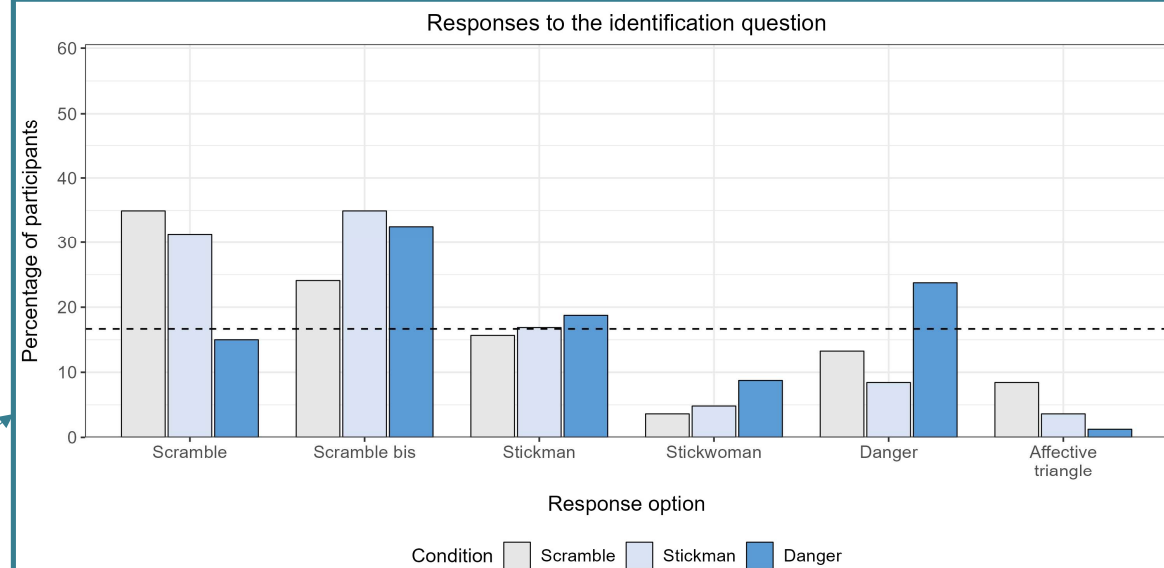
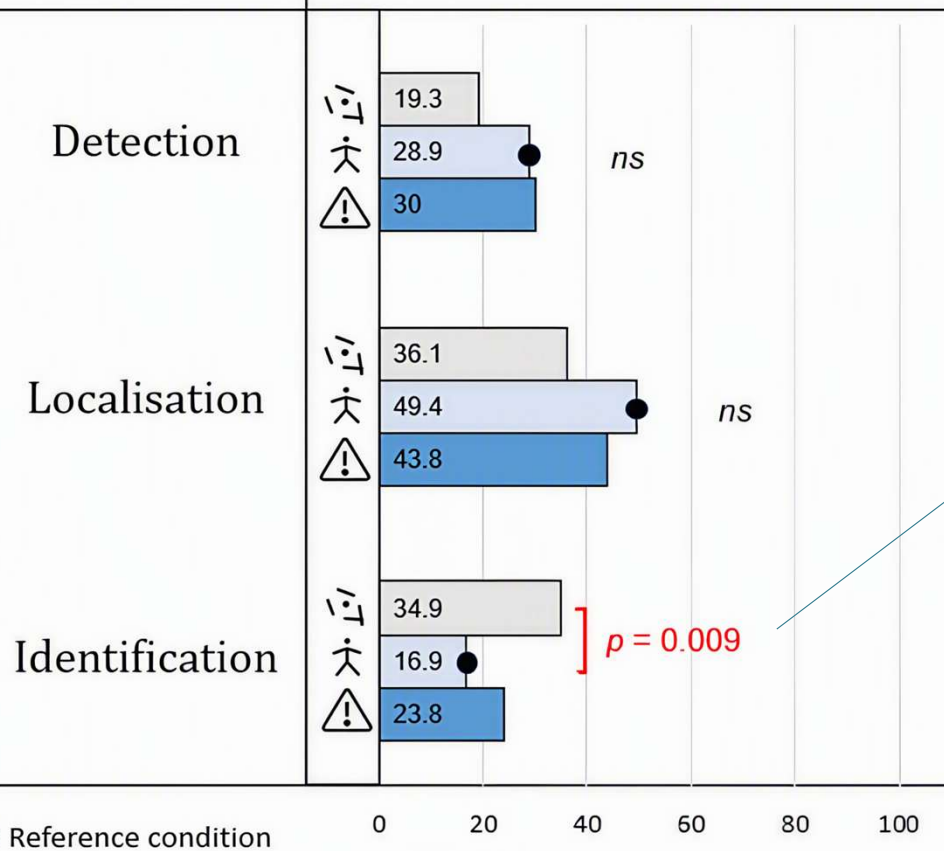
⇒ One of the scrambled pictograms was always selected above chance level.

⇒ Response bias in favor of meaningless pictograms?

Results – critical trial

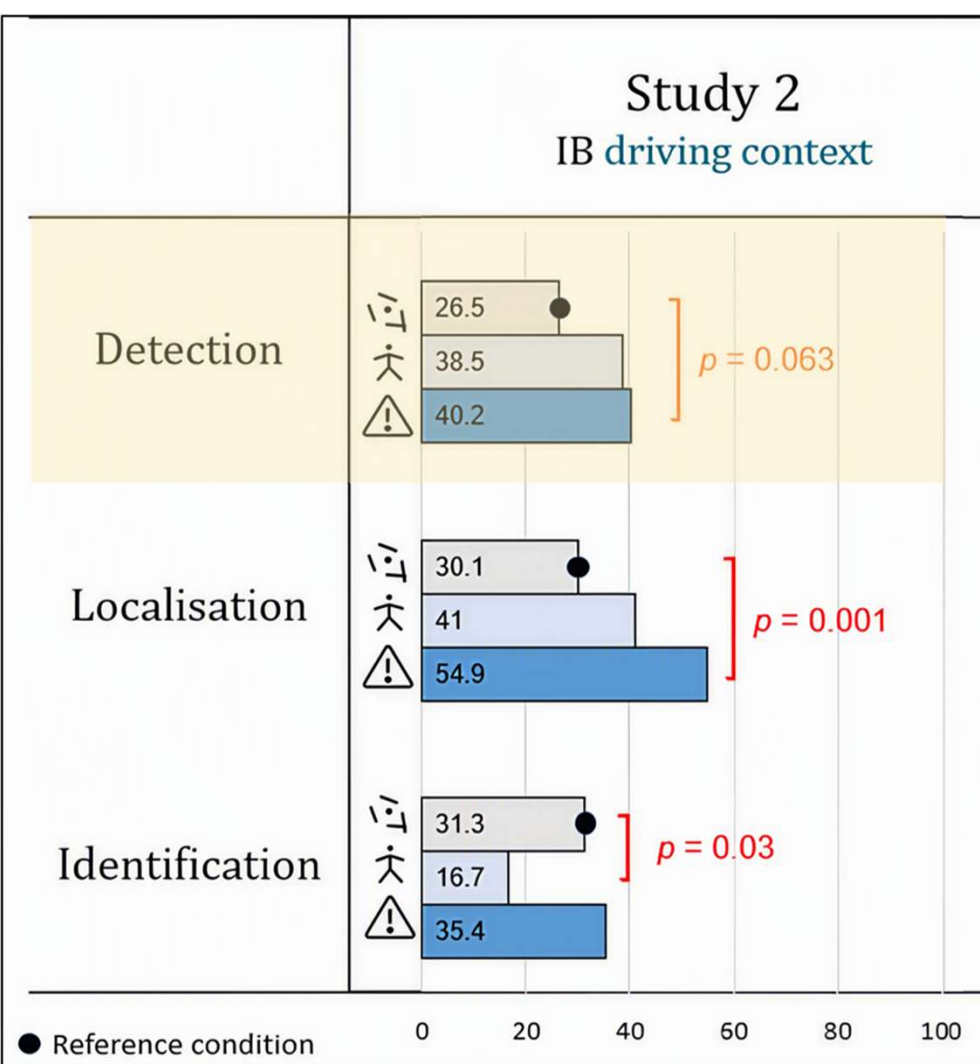
No evidence that the semantic or emotional value of unexpected stimuli affects IB.

Study 1
Classical static IB paradigm

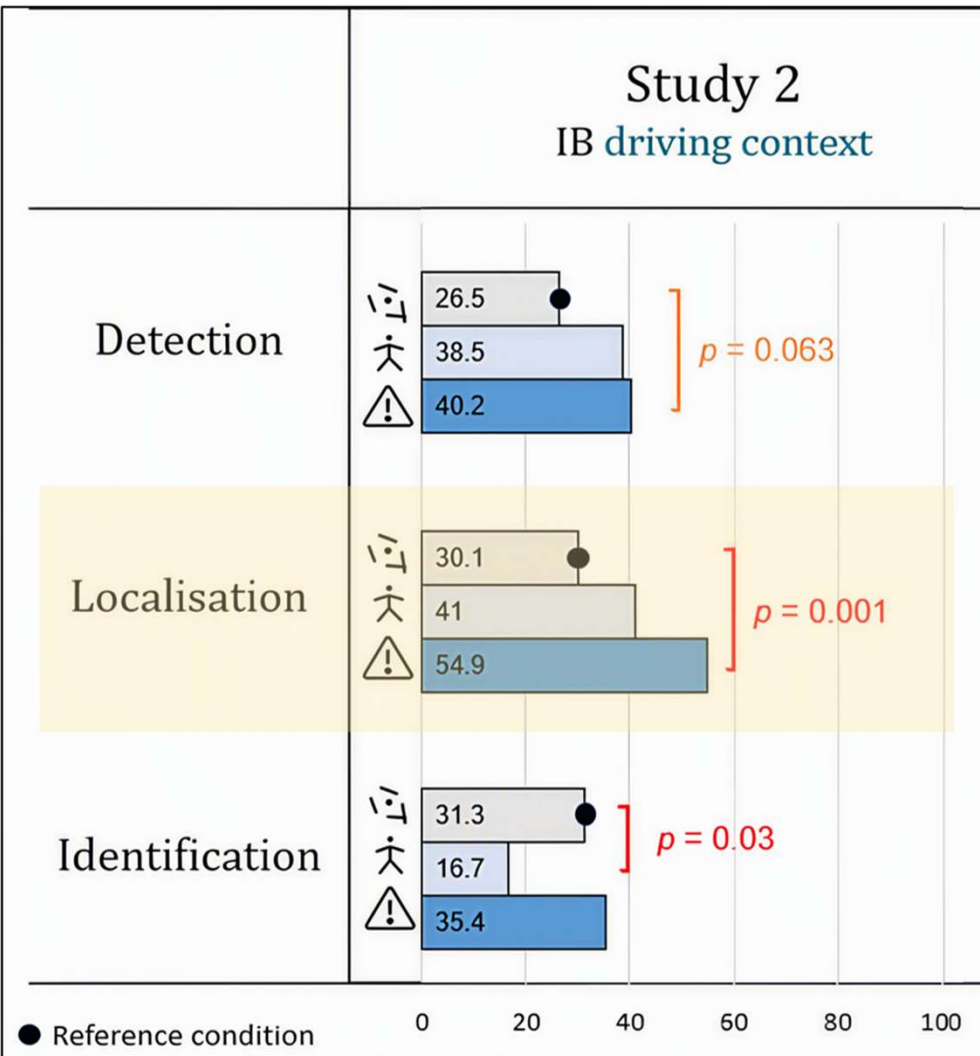


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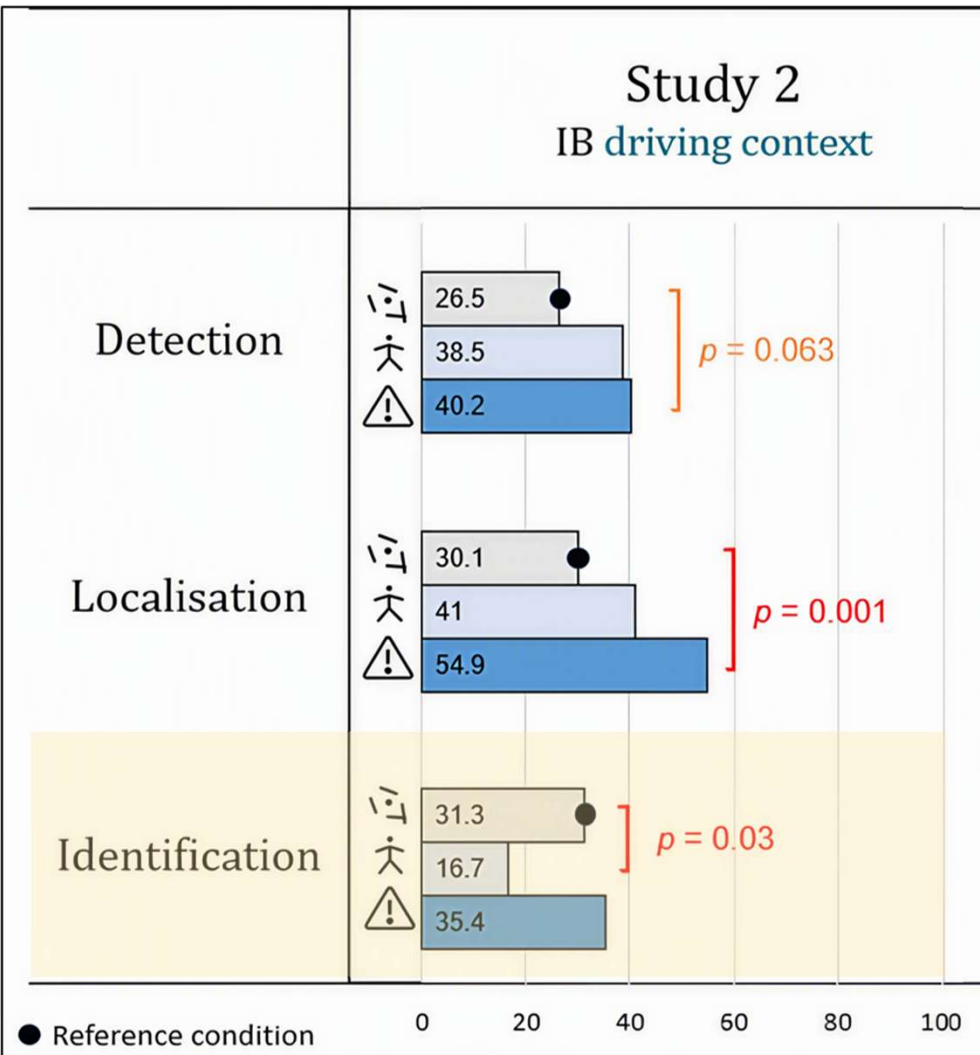
Results – critical trial



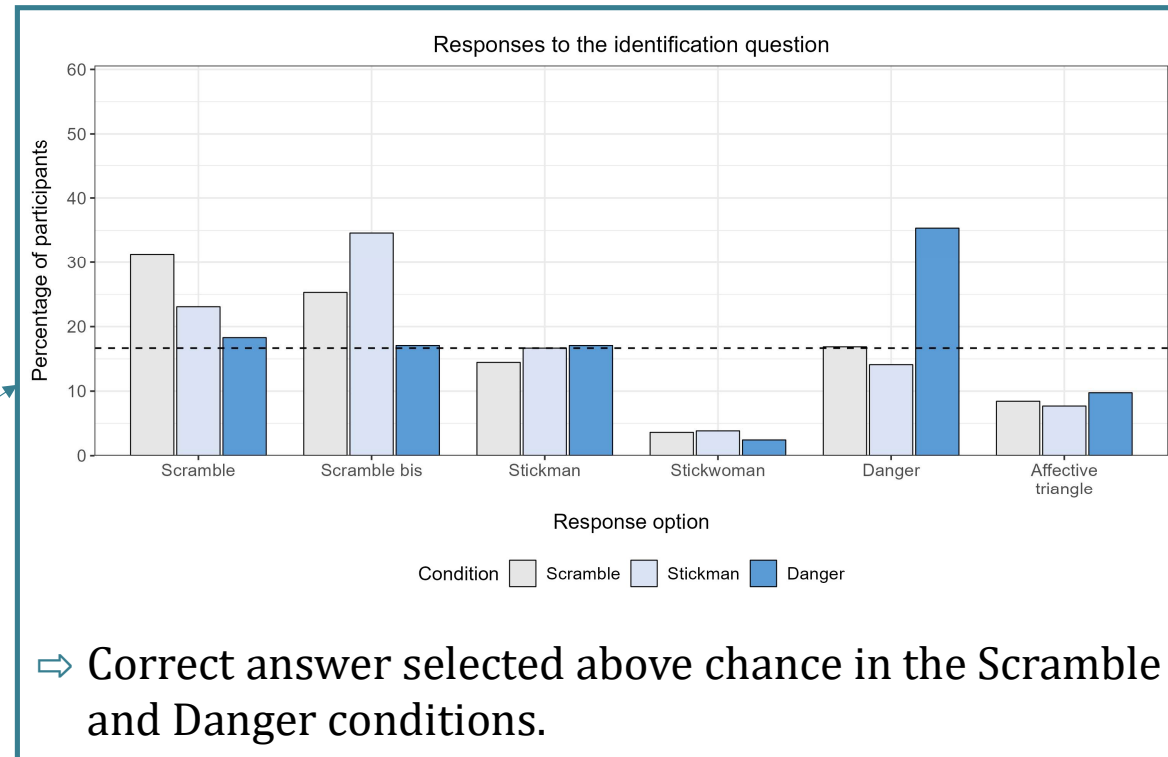
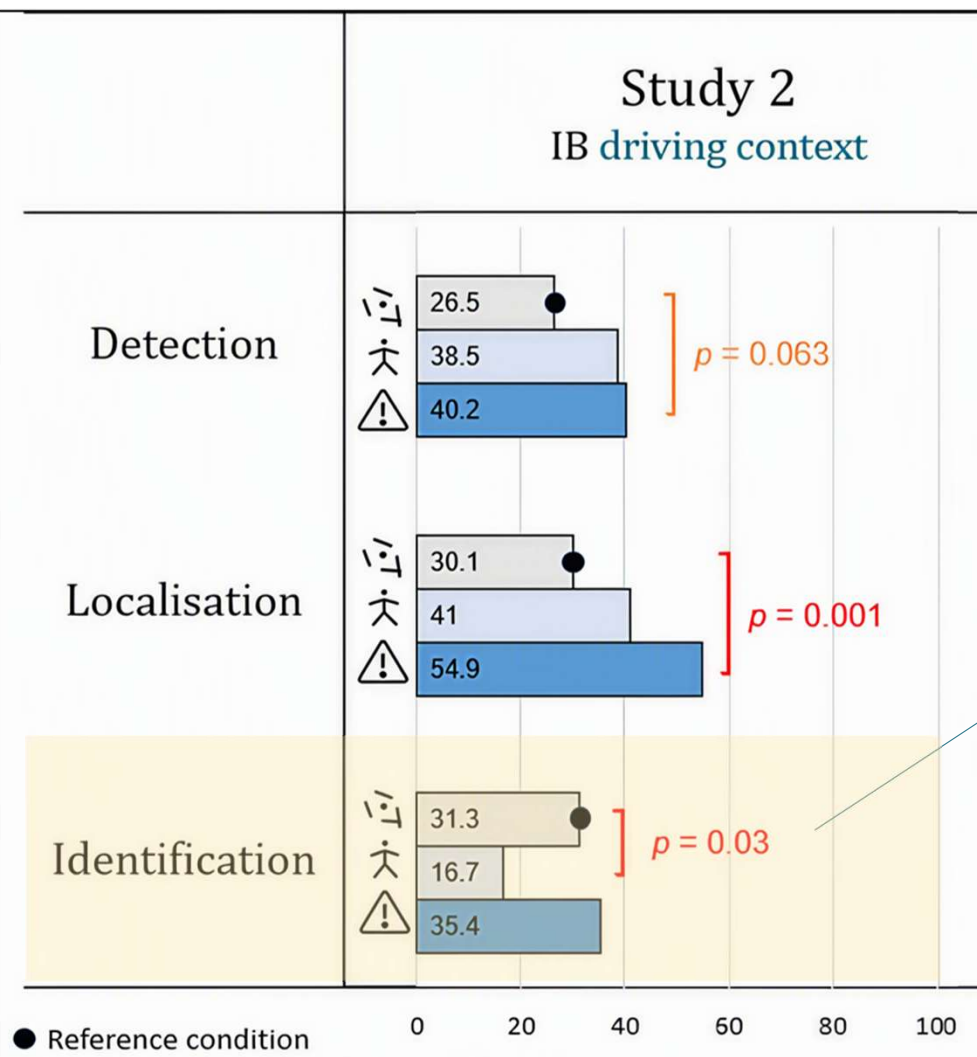
Results – critical trial



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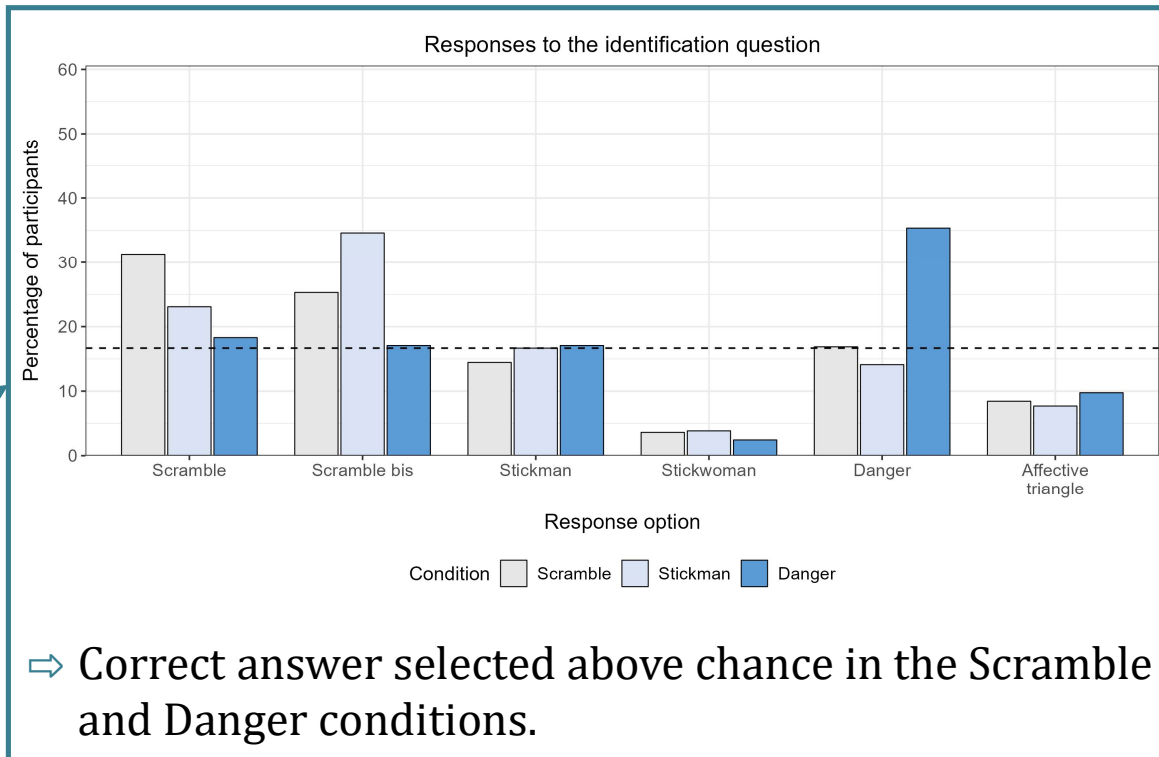
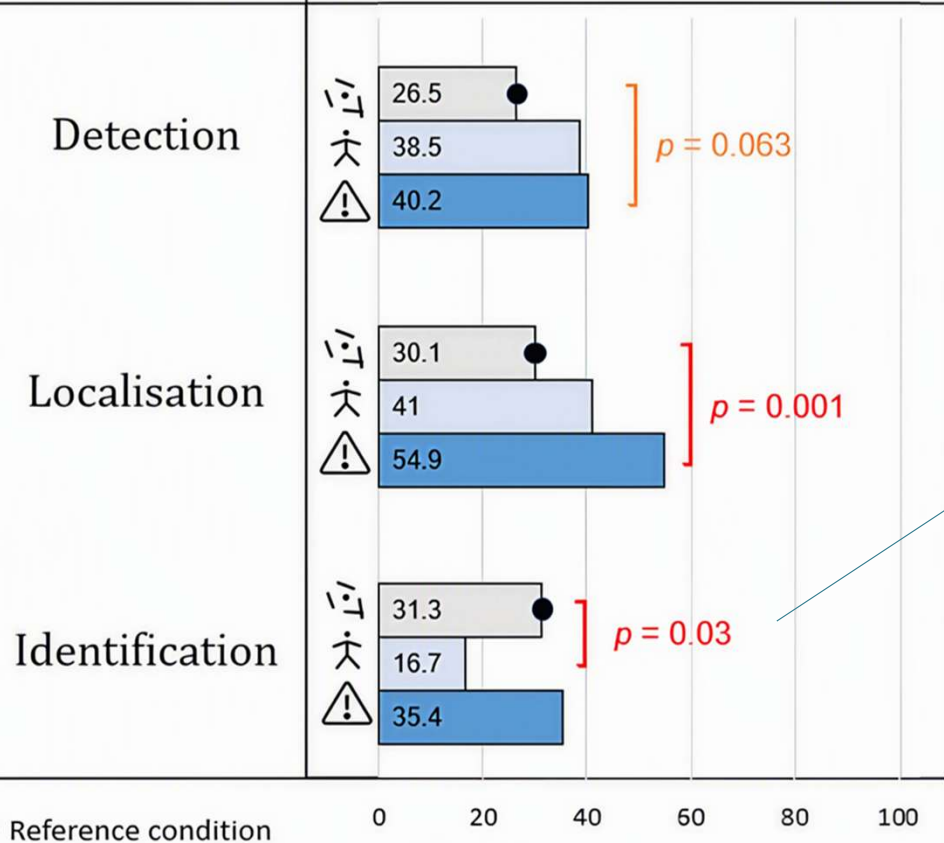
Results – critical trial



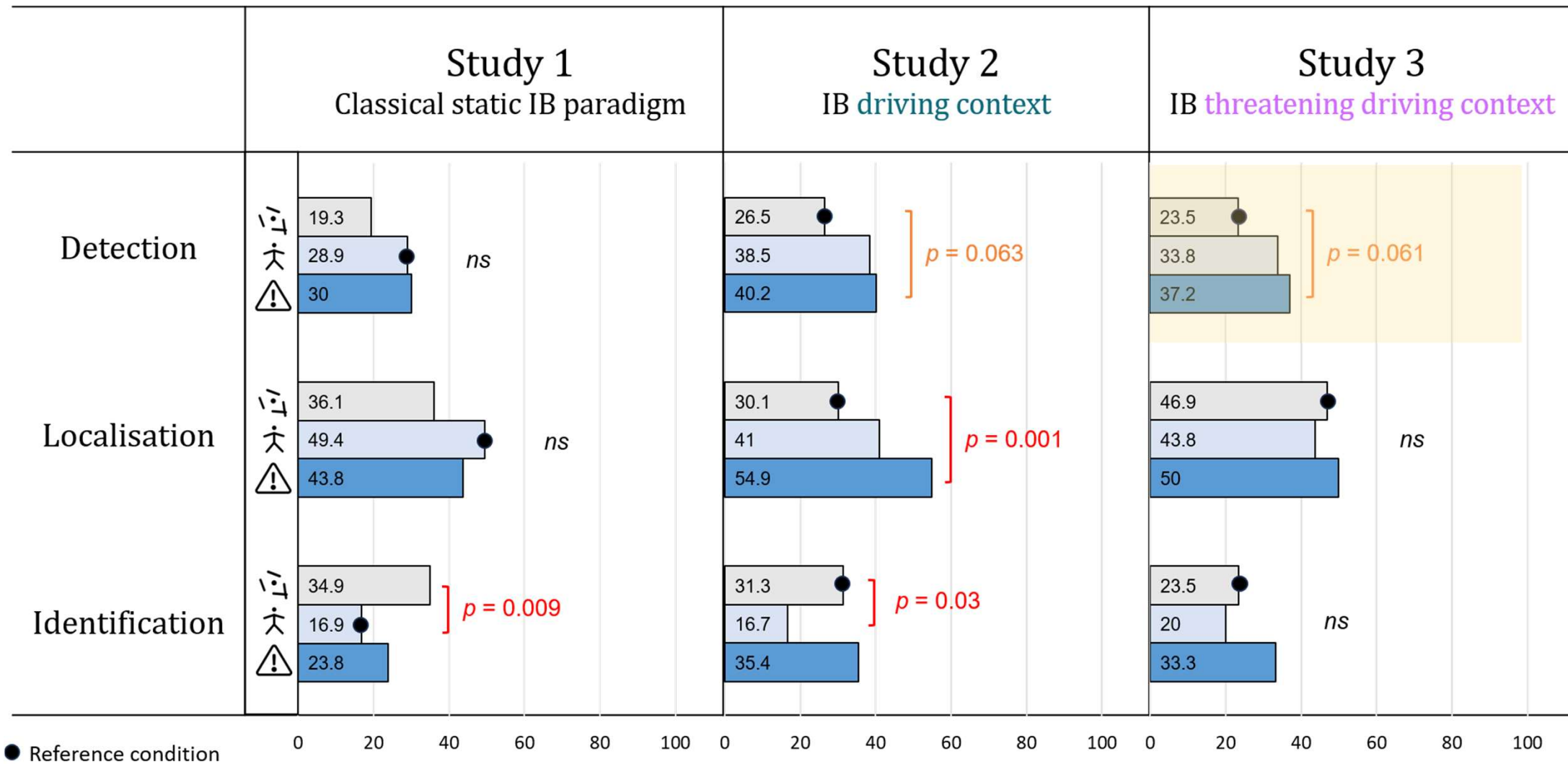
Results – critical trial

The driving context facilitated the localisation of the danger symbol.

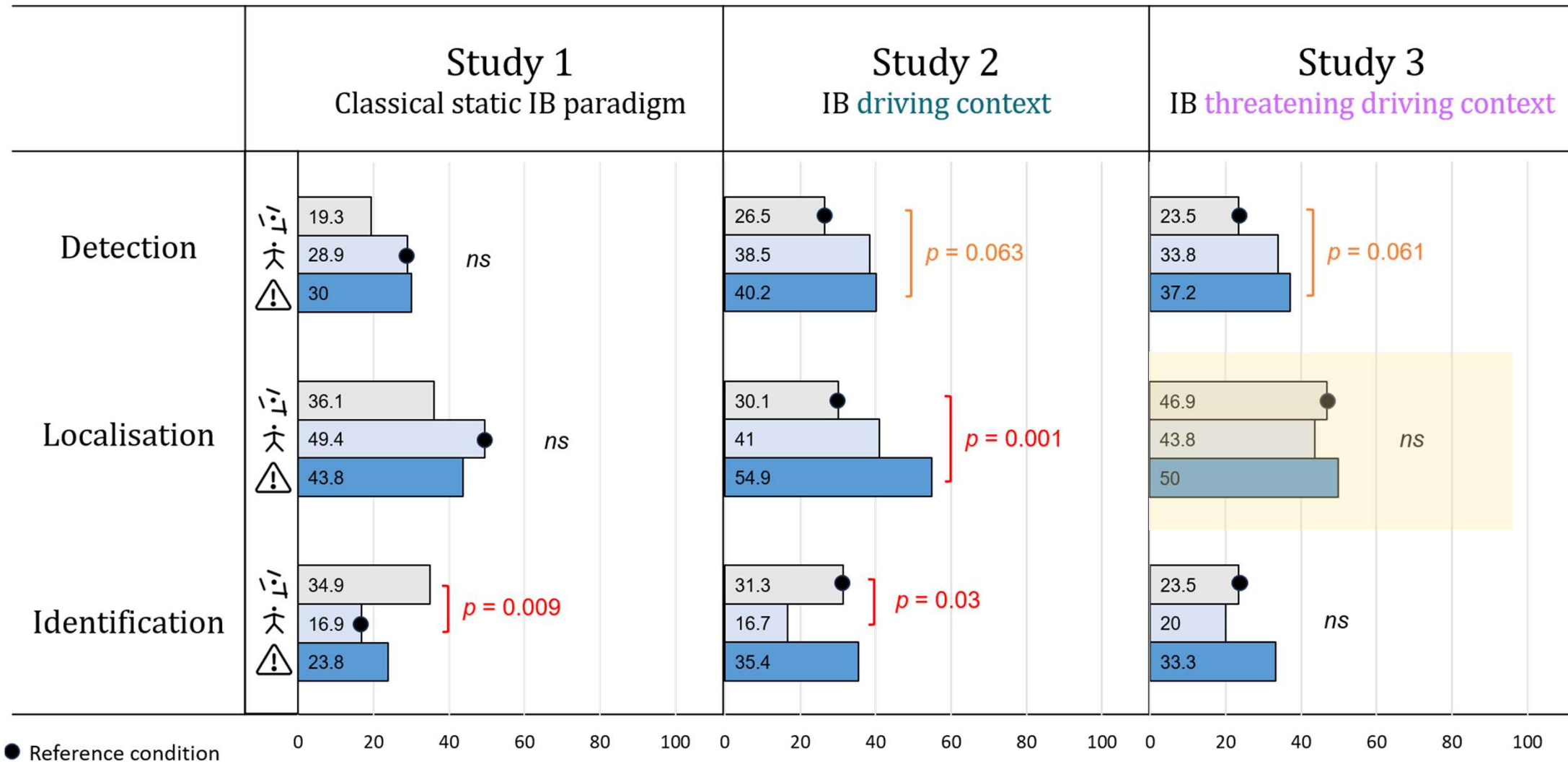
Study 2
IB driving context



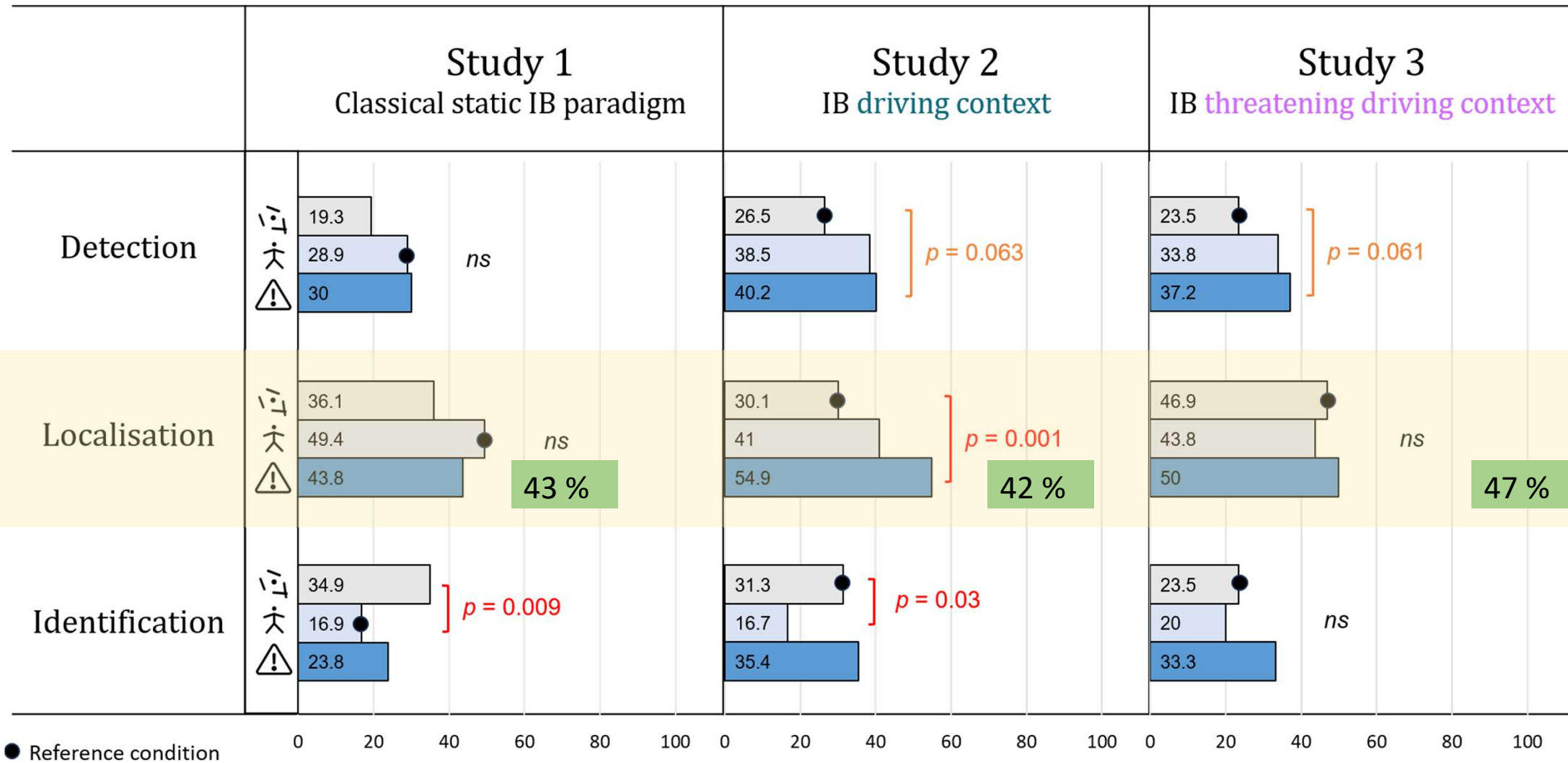
Results – critical trial



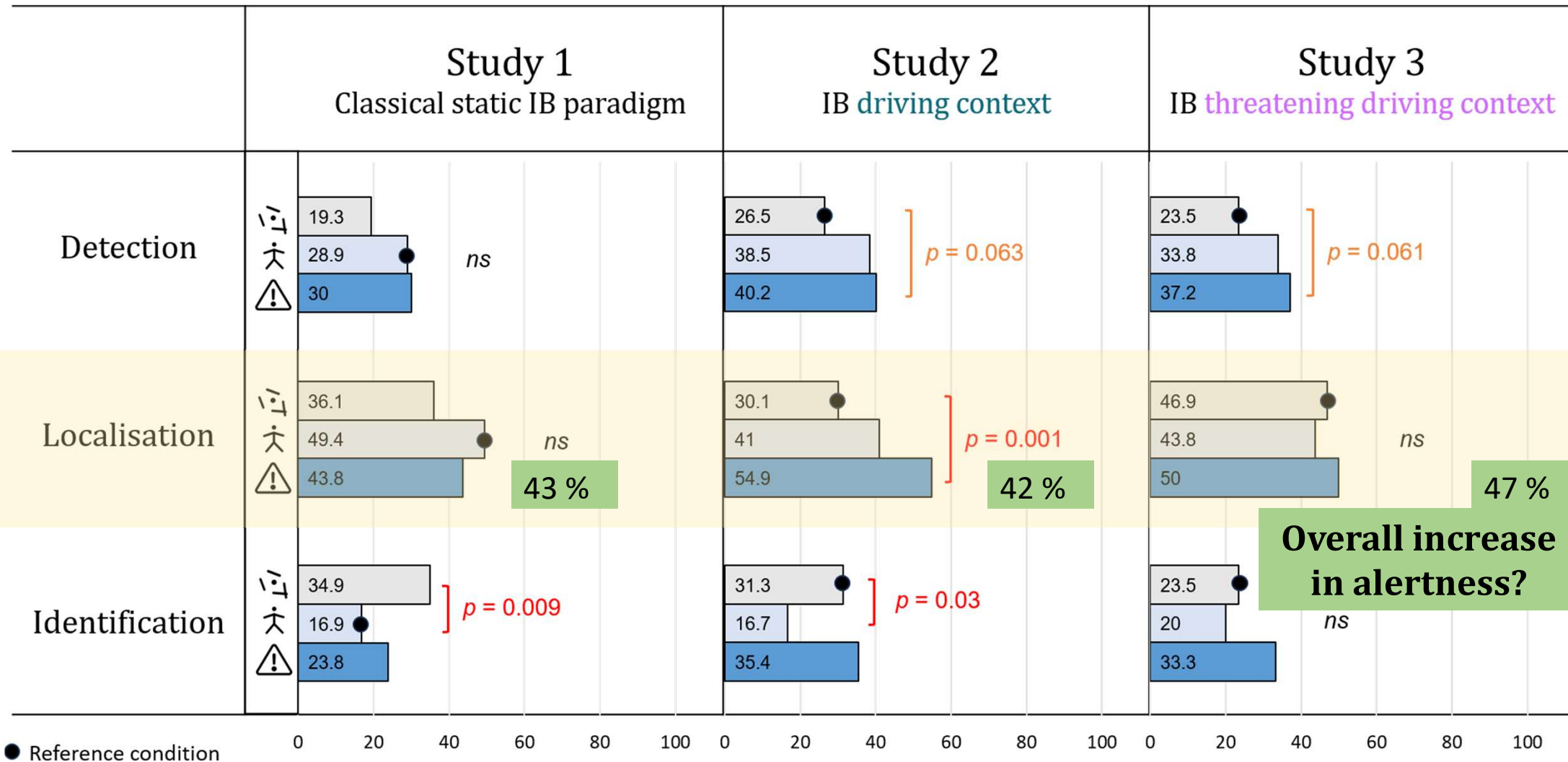
Results – critical trial



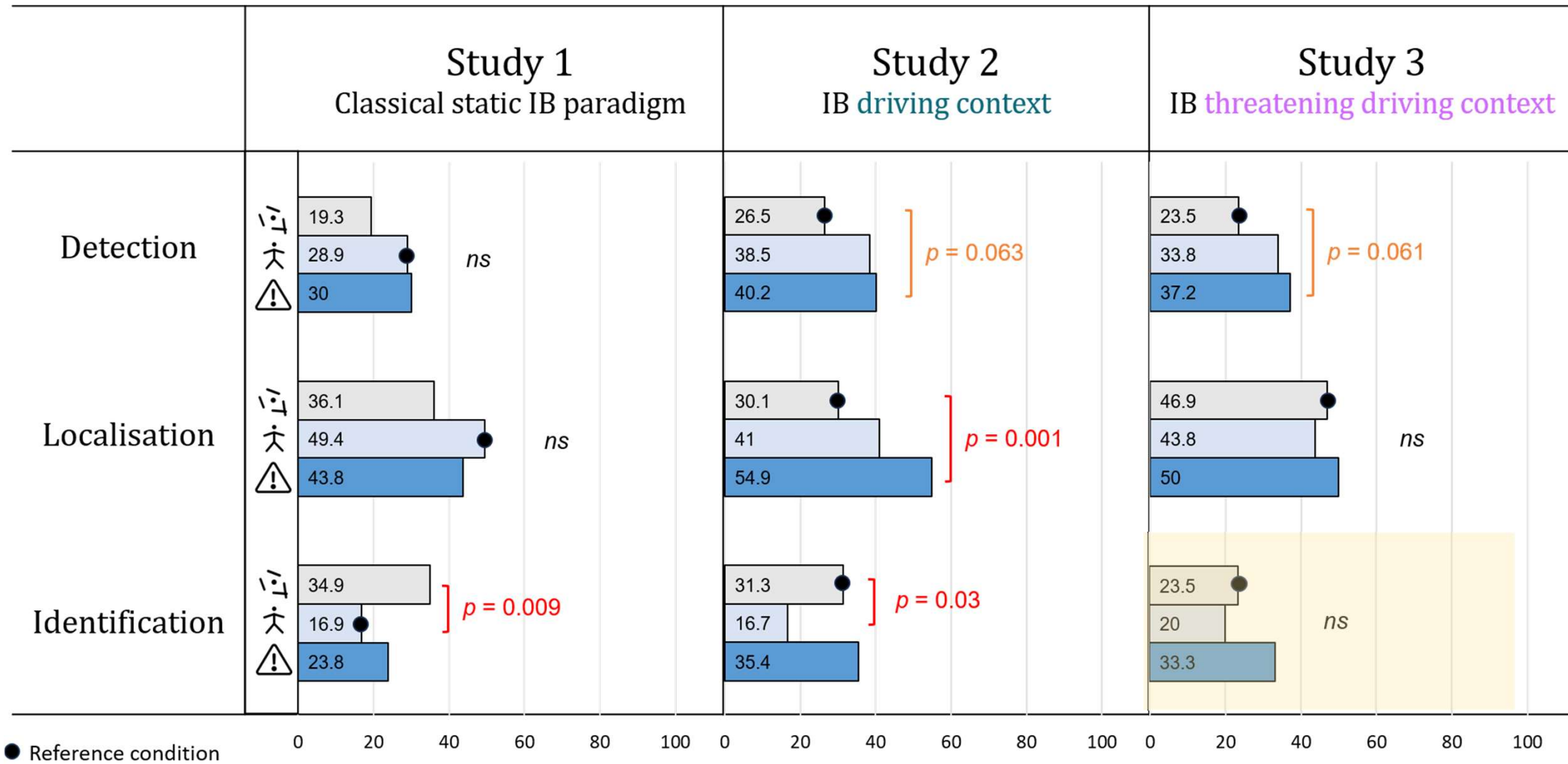
Results – critical trial



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Conclusion

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 - More clearly relevant to driving than the stick figure/pedestrian ?

Conclusion

- The semantic and emotional value of the unexpected stimuli did not affect IB when they were not relevant to the context (Study 1).
- Danger symbol more likely to be detected/localised in a (threatening) road context (Studies 2 and 3).
 - More clearly relevant to driving than the stick figure/pedestrian ?
- Road-related pictograms may be preferable for warning signals.



*Thanks for your attention!
Any questions?*

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at Nantes Université

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