« *Red Cars are Faster than Other Cars* »: The Impact of Color on Children's Estimation of Speed

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CONTEXT 1/2

- ✓ Pedestrian trauma represents a significant proportion of all road traumas, …
- ✓ … **young pedestrian are over-represented** in all these road traumas (At ages 6-10 years, children are at highest risk of pedestrian collision)
- ✓ **Children's adaptation** to an oncoming vehicle's distance and speed is a critical component of their street-crossing decision-making
- ✓ From a **cognitive** point of view → road crossing ability is a high and complex mental activity ➔ the individual has to process **dynamic** and complex information from his/her surrounding environment, to make a decision,
- ✓ No study has investigated the **impact of colors** for different children's age groups while some authors recognized that colors can be determinant

CONTEXT 2/2

- ✓ From a **statistical point of view**, some data revealed that certain colored cars are more likely than others to be involved in an accident becsause physical explanations exist (e.g., darker colors make it harder for vehicles to be seen, especially at night)

- ✓ From a **psychological point of view**, four hypotheses :
  1) the preferred color by buyers of fastest cars is red (Sutherland, 2015)
  2) red color guide attention towards important objects in nature, in particular for mammals (ethology)
  3) a series of anime and movies display red cars, these cars being very fast (Rondier, 2004)
  4) red is often associated with positive emotion for children (Boyatzis, 1994)

Cars©

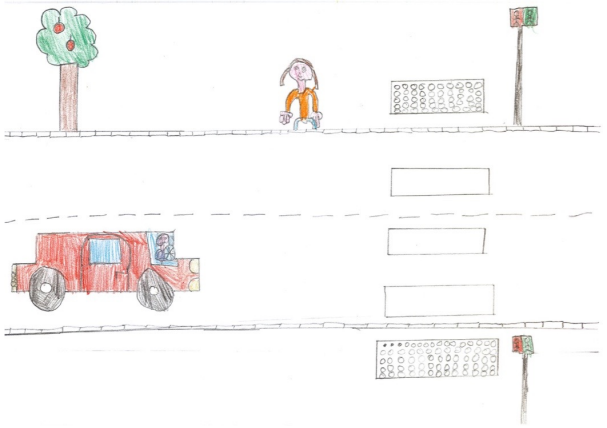
The Duke of Hazzard©

Starsky and Hutch©

Fast and Furious©

Magnum©

Nicky Larson©



METHOD 1/2

Participants :

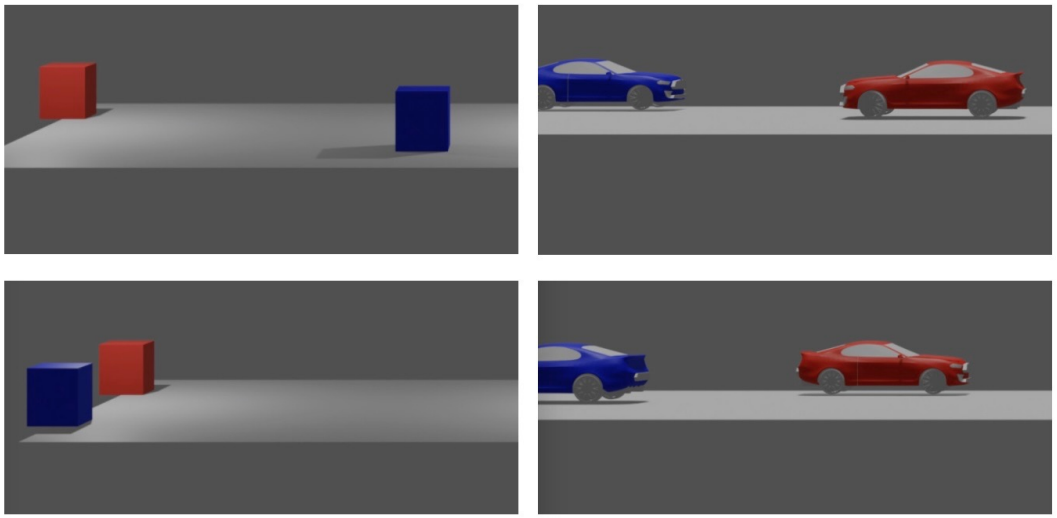
- ✓ 67 French participants (34 boys and 33 girls; Mean age = 7;3 years-old, SD = 0.9 months)
- ✓ All children come from the same elementary school located in the mid-town.
- ✓ All are French native speakers and the majority (86.4%) lives in urban area

Independent factors:

1. Type of objects in movement, with two modalities: Cube *vs*. Car
2. Direction of the objects, with two modalities: Equal (e.g., going in the same direction) *vs*. Different (e.g., passing each other)
3. Color, with two modalities: Blue *vs*. Red
4. Speed of the objects, with three modalities: Slow, Medium, High. The corresponding selected test speeds are 30 km/h (Slow), 50 km/h (Medium), and 70 km/h (High)

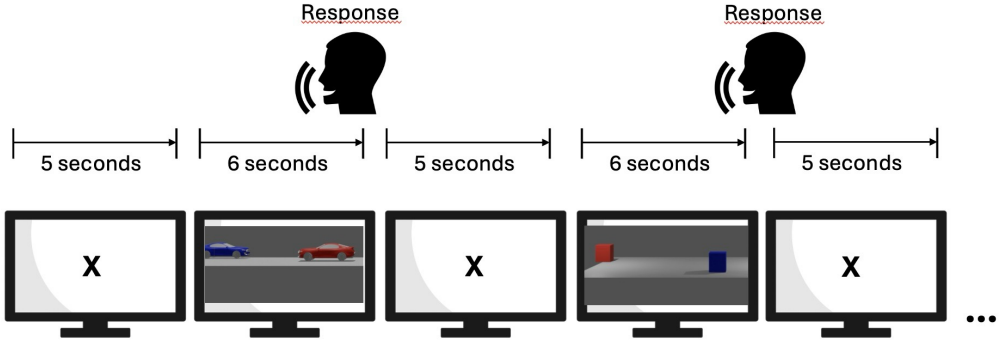
METHOD 2/2

The Material, the Protocol and the Dependent Factor (measure):



The software Blender© → 24 videos showing objects in movement. Blender is a free, open-source software package dedicated to 3D creation.

« *According to you, what was the fastest object (or car)?* » → oral response



MAIN RESULTS 1/5

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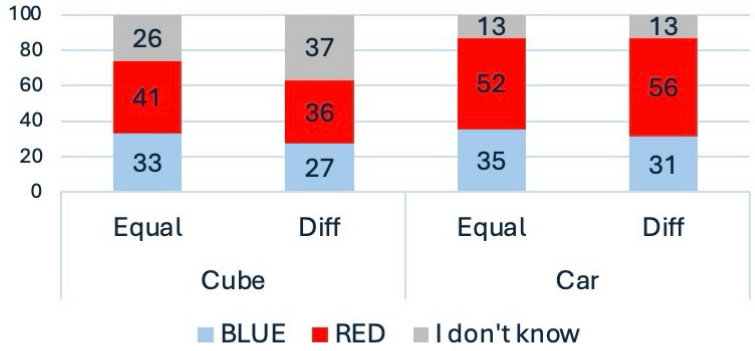

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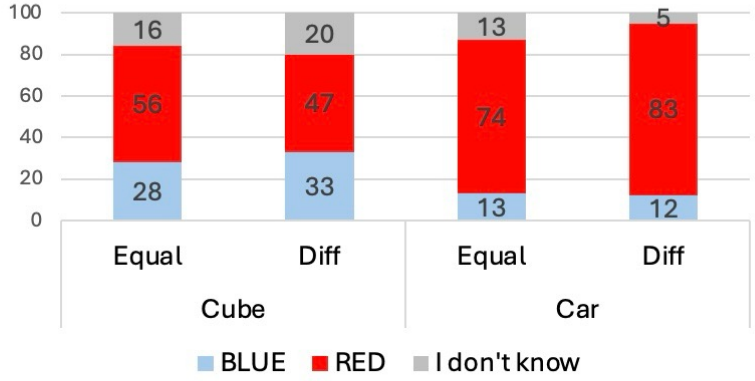

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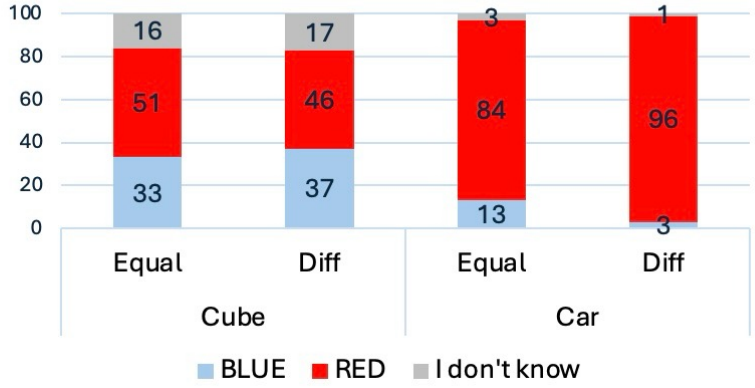
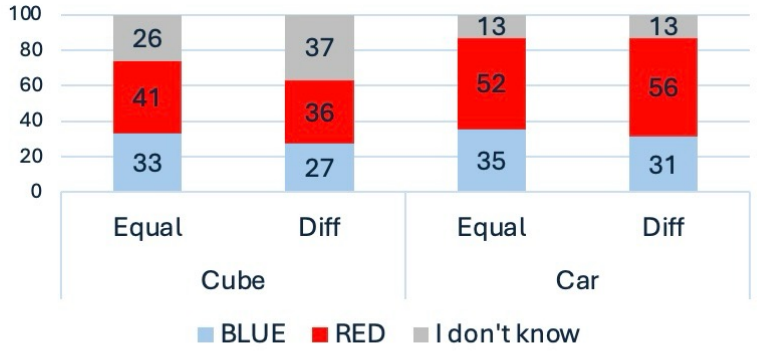


MAIN RESULTS 2/5

1 2 3 4

Direction (Equal *vs*. Different) of the objects/cars has no impact on responses given by the children (*p*=.06)

LOW



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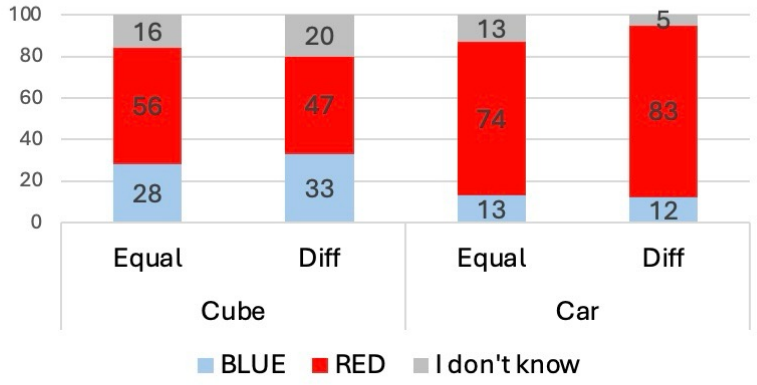

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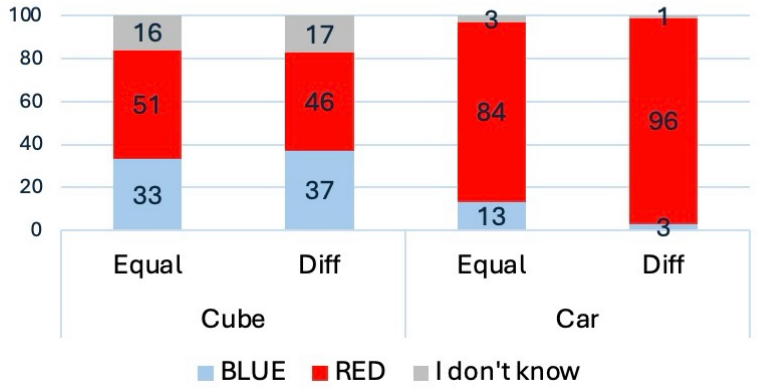
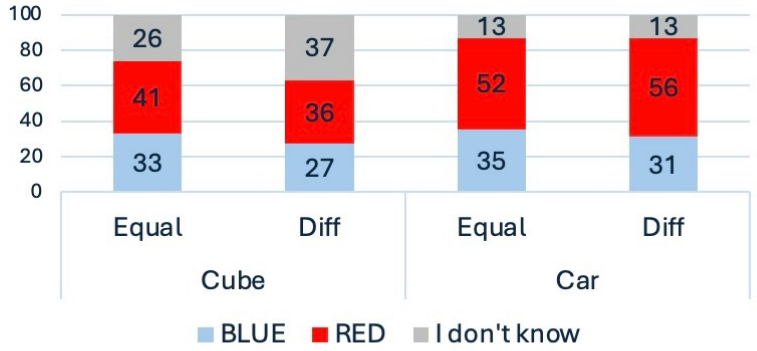


MAIN RESULTS 3/5

1 2 3 4

LOW



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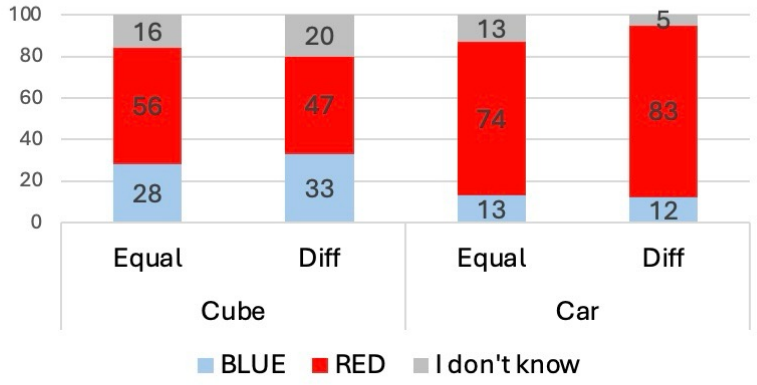

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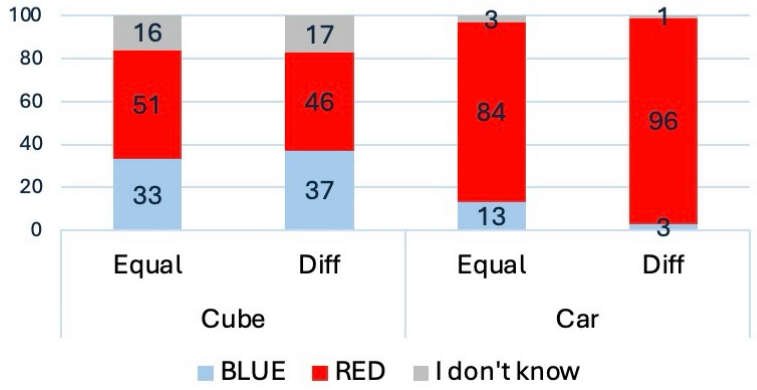


Type of objects in movement (Cube *vs*. Car) has a significant impact on responses given by children

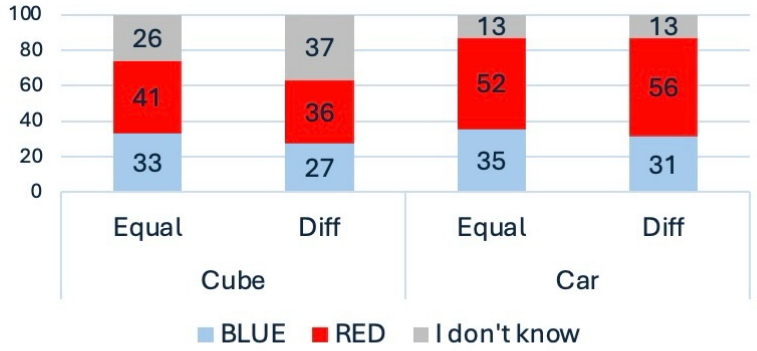
- When the objects are cubes →the number of "Red" and "Blue" responses is identical (*p*=.06)
- When the objects are cars → the number of "Red" responses is significantly superior than "Blue" responses (*p*=.004)

MAIN RESULTS 4/5

1 2 **3** 4

Red objects (cubes or cars) are significantly perceived as the fastest (30% of children answered "Red", while only 12.41% answered "Blue". $p < .001$)

LOW



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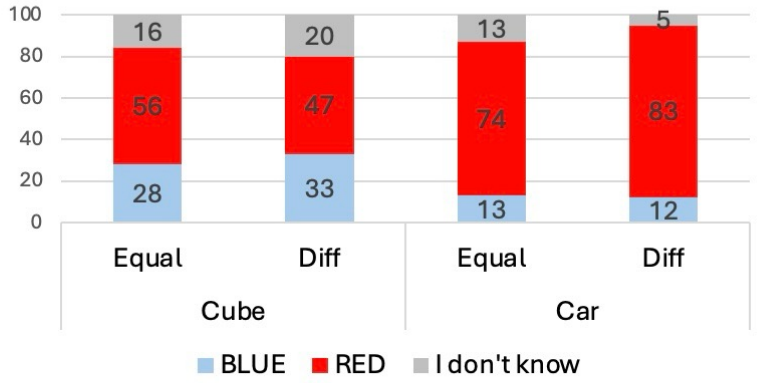

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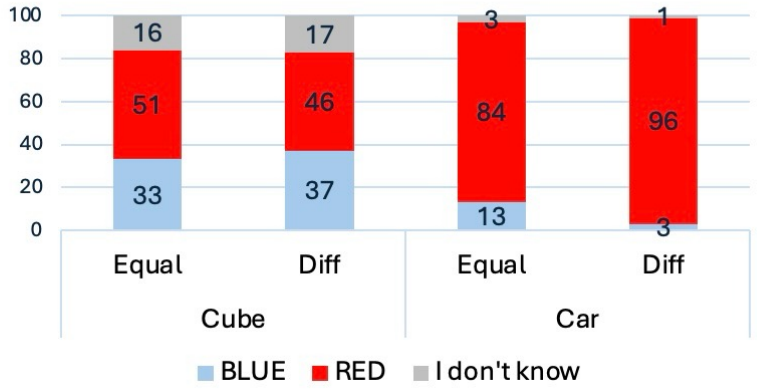
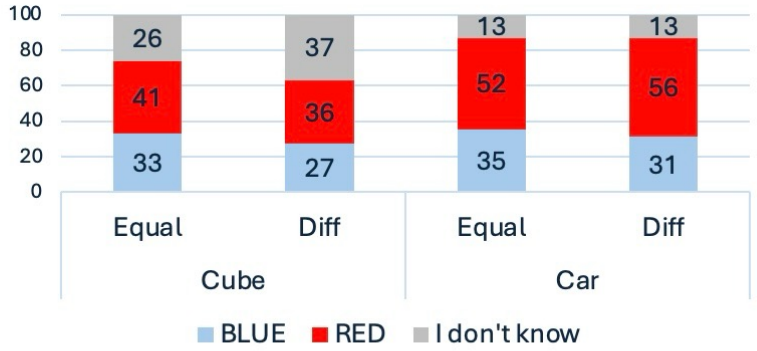


MAIN RESULTS 5/5

1 2 3 **4**

LOW



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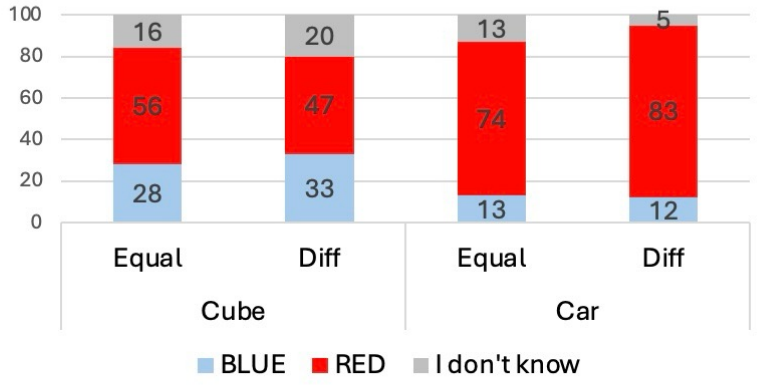

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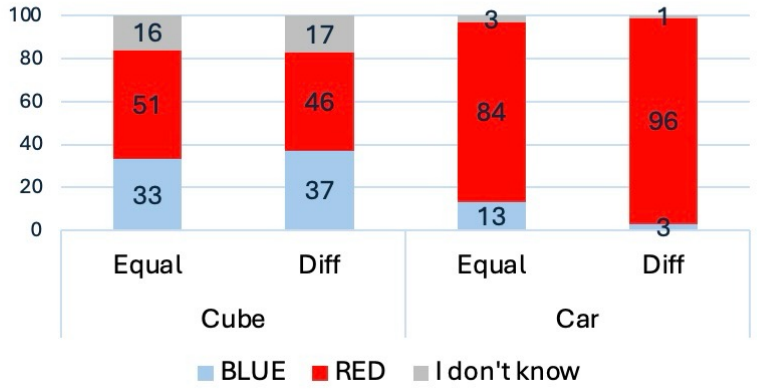


Speed has a significant impact on responses:

- For the "Slow" speed condition (30 km/h), 46.2% of children answered "Red", while 31.5% answered "Blue", *p*= .03)
- For the "Medium" speed condition (50 km/h), 65% of children answered "Red", while 21.5% answered "Blue" *p*= .003);
- For the "High" speed condition (70 km/h), 70.25% of children answered "Red", while 20.5% answered "Blue", *p*= .001)

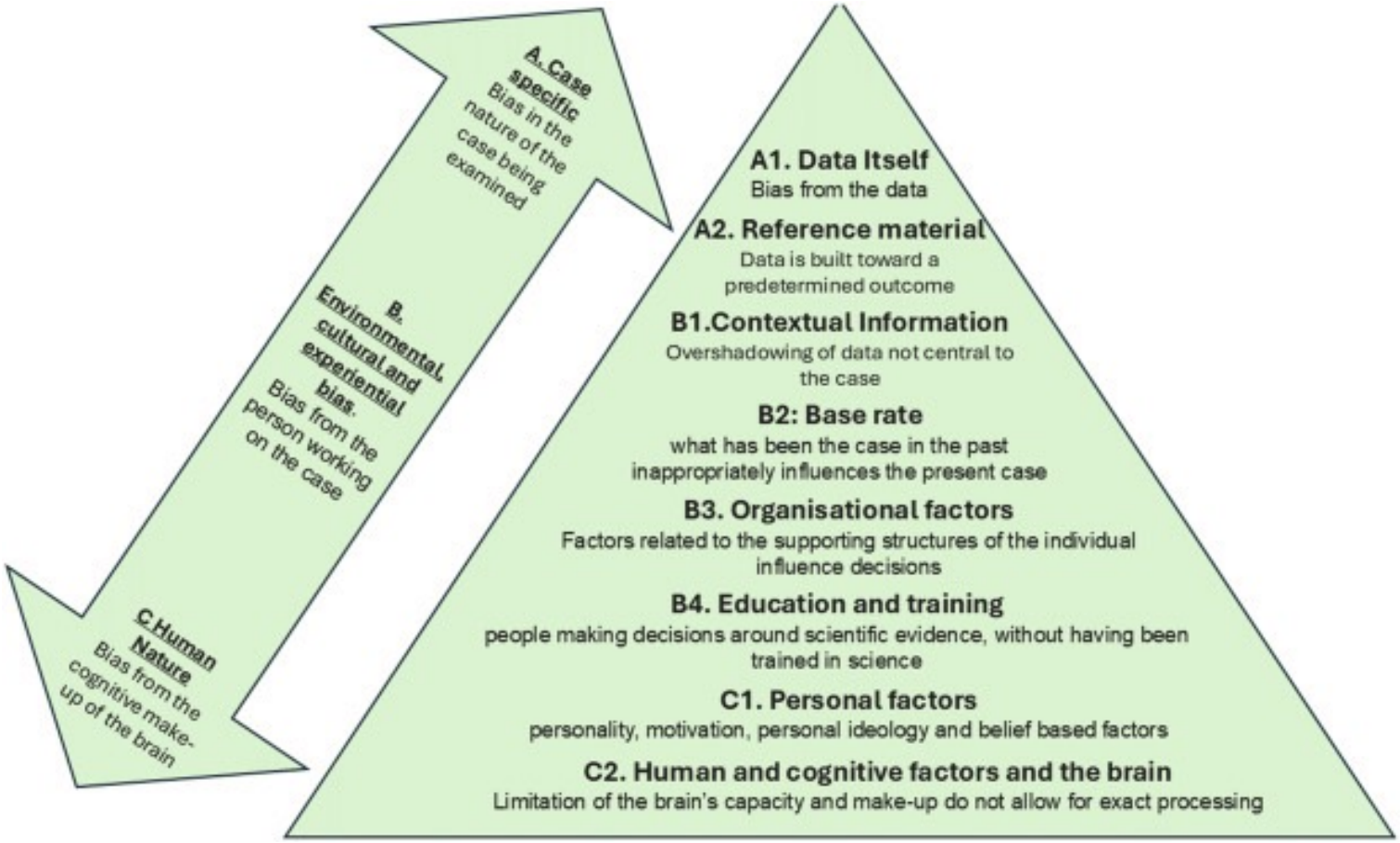
➔ In other words, the faster the speed, the more likely the children are to respond with « Red ».

DISCUSSION 1/2

- ✓ **Red objects** (whether cubes or cars) are significantly perceived as the fastest
- ✓ When the objects are **cars**, the number of « Red » responses is significantly higher than the « Blue » responses
- ✓ **The faster the speed**, the more likely the children are to respond with « Red »
- ✓ Finally, for our participants, red objects are significantly perceived as faster, **especially when they are cars and moving at high speeds**

DISCUSSION 2/2

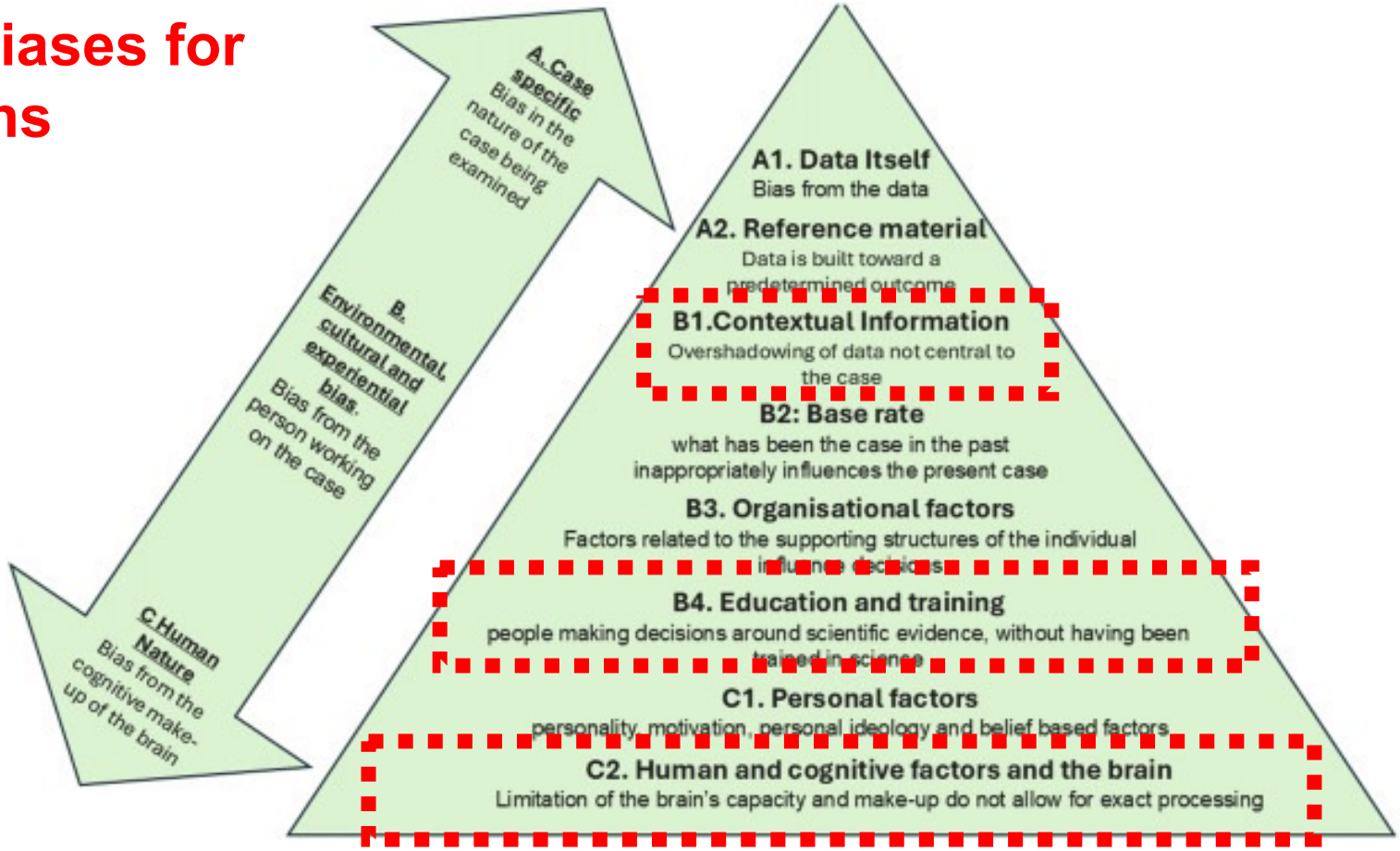
Dror's sources and types of cognitive bias adapted for pedestrian and drivers (Xatkins & Musselwhite, 2025)



DISCUSSION 2/2

three cognitive biases for young pedestrians

Dror's sources and types of cognitive bias adapted for pedestrian and drivers (Xatkins & Musselwhite, 2025)



Thank you for your attention …

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