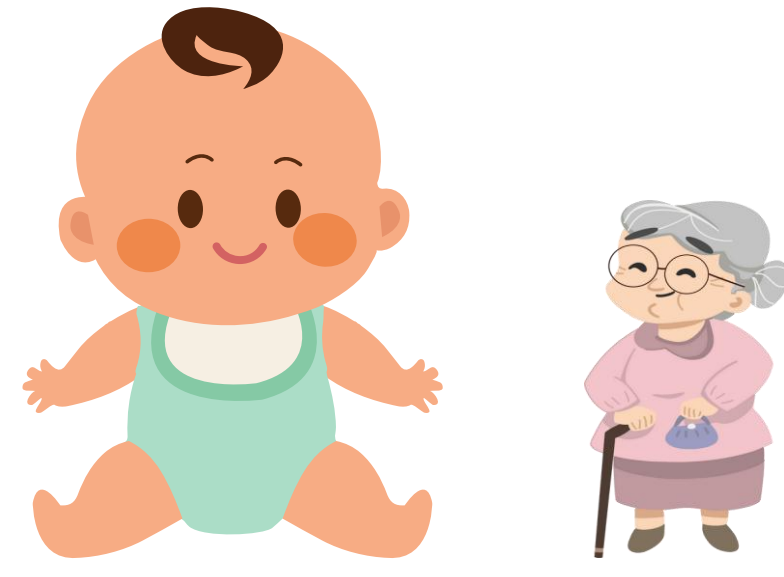


# “He’s bigger so he has to be older”: Children’s development of age concepts from 3 to 5 years old

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## Background

- Age is a remarkably complex concept, as adult-like understanding requires coordinating knowledge about time, number, and biology
- 3- to 5-year-old children struggle understanding many aspects of age<sup>1</sup>
- Previous studies found that children (often erroneously) base relative age judgments on size, responding that someone who is bigger must be older (see right)<sup>2-5</sup>
- Thus, it has been argued that children initially conflate age with size
- These studies may have underestimated children’s understanding by:
  - Biasing children to respond based on size by providing extreme, unrealistic size differences
  - Not providing children with other cues to age (e.g., numerical age)



## Results

- While 3-year-olds did not differ from chance in the Age Judgment Task both when numerical ages were provided and when they were not, 4- and 5-year-olds performed above chance in both conditions
  - By 4 years old, children were more accurate when numerical ages were provided than when they were not (Fig. A)
- Performance on the Later-Greater Task predicted performance on the Age Judgment Task when numerical ages were provided
  - This suggests that 3-year-olds’ lack of use of numerical age cues was due to a lack of number knowledge rather than deeming these cues to be irrelevant
- Children exhibited a size bias in their age judgments, which was reduced when numerical ages were provided (Fig. B)
- Performance on the Autobiographical Memory Task did not relate to performance on the Age Judgment Task

## Current Project

- Research question:** How do children develop an understanding of age?
- Do children indeed initially conflate age with size? (when provided with less drastic size differences in an age judgment task)
- How may cognitive advancements in related domains (e.g., number, time) contribute to the development of an understanding of age?

## Methods

- Participants: 122 children between 3 and 5 years old ( $M_{age} = 4.53$ )

### 1. Age Judgment Task

Participants judged who is older for pairs of children aged 3, 5, 7, and 9 years old (18 trials)

- Congruence of size and age cues was manipulated (within subjects; see below)
- Conditions: Numerical ages were either provided or not provided (between subjects)



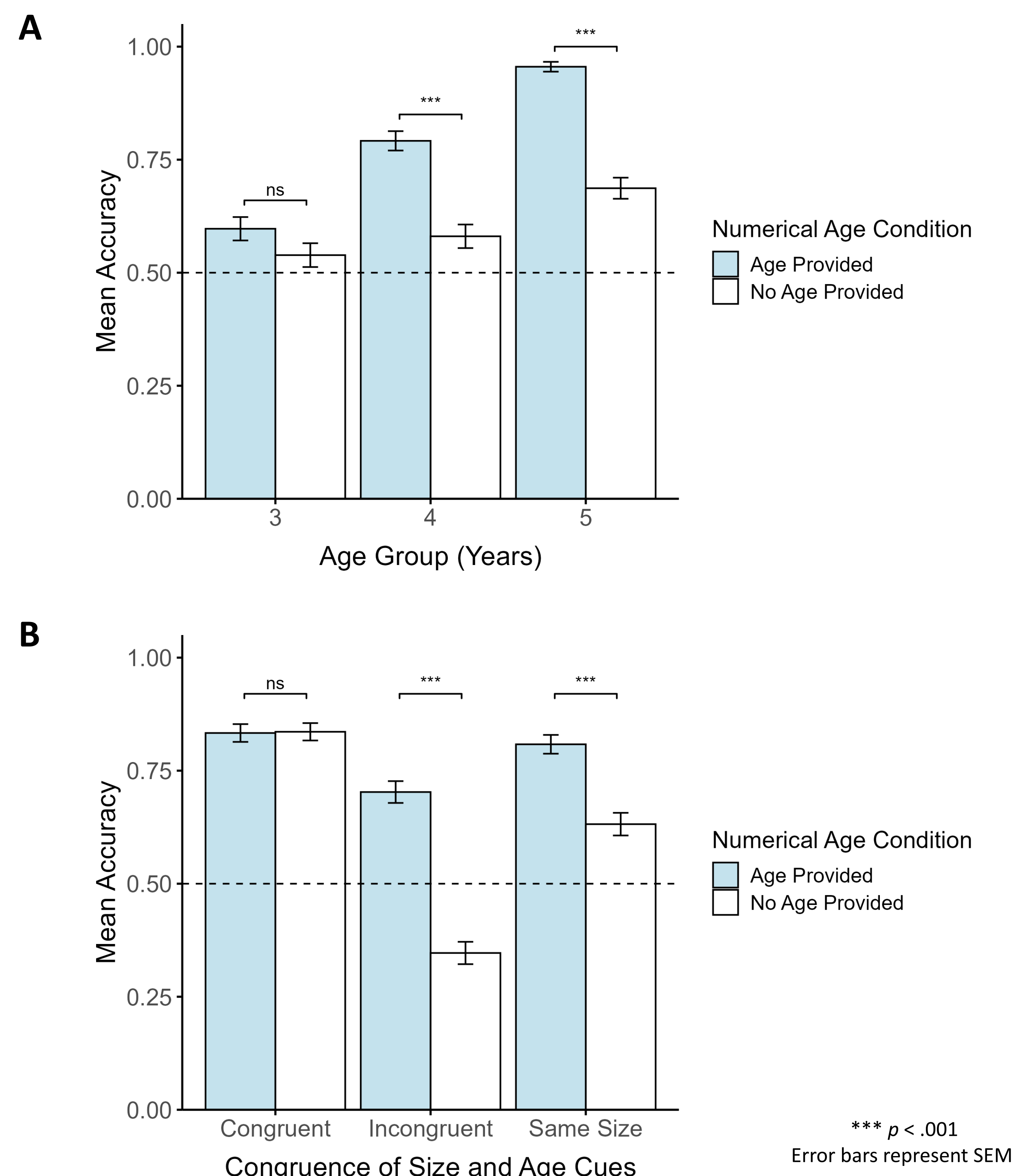
### 2. Later-Greater Task of Number Knowledge

Participants judged which number is greater for each pair of numbers included in the Age Judgment Task (e.g., 3 vs. 5)

### 3. Autobiographical Memory Task

Participants were asked to recall two recent memories and judge which occurred a long time ago and which occurred a short time ago

## Performance on Age Judgment Task



## Discussion

- Main finding:** Children initially base their age judgments on size before successfully basing them on people’s numerical ages once they learn a number system
- Ongoing follow-up studies are addressing remaining open questions:
  - Do children indeed initially conflate age with size or did younger children respond based on size in this experiment because they did not have any other interpretable cue to respond based on?
  - Could children’s confusion with size be lexical rather than conceptual? (i.e., having representations of age differences but viewing “older” as a synonym for “bigger”)

Children transition from basing age judgments on size to numerical ages at 4 years old, possibly reflecting a conceptual change in the development of the concept of age

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