When is confidence a justified credibility cue?

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Introduction

Rather than passively absorbing knowledge from others, **children are discerning in whom they learn from.** For example, children preferentially learn from models who demonstrate:

- Prior Accuracy (i.e., a history of being correct) [1, 2, 3]
- Expertise in a given domain [4, 5]
- Social Prestige (i.e., preferential attention from others) [6]
- Social Dominance (i.e., deference from others) [7]
- Confidence (via verbal and/or nonverbal cues) [8, 9, 10, 11]

Although one's **confidence** *tends* to be correlated with their knowledge, it is possible that one's confidence is unjustified—that is, they are overconfident.

Questions of Interest

1. **Do children prefer to learn from an individual whose confidence is justified**? Or do they prefer to learn from a confident individual, regardless of whether their confidence is justified?
2. **Do children think a justifiably confident model is smarter than an unjustified, or overly-confident, model**?

Experiment 1: Unjustified Confidence vs. Justified Hesitance

502 children 3-12 years and **60 adults** were randomly assigned to either the **Informed** or **Uninformed Condition**.

Procedure

History Phase: Four Informed/Uninformed Trials
Models were shown (**Informed**) or not shown (**Uninformed**) 4 boxes' contents and asked to identify contents.

Confident Answer   Hesitant Answer
Informed (shown contents)

Confident Answer   Hesitant Answer
Uninformed (not shown contents)

Test Phase 1: Four Endorse Trials

- Models shown a picture of an "unusual animal" and asked to name the animal.
- Each model confidently provided a different novel name ("Modi", "Toma")
- **What do you think it's called – a Modi or a Toma?**

Test Phase 2: Four Ask Trials

- Participants shown pictures of other unusual animals.
- **Who do you want to ask what animal this is? Who do you think will know that?**

Post-Test Questions
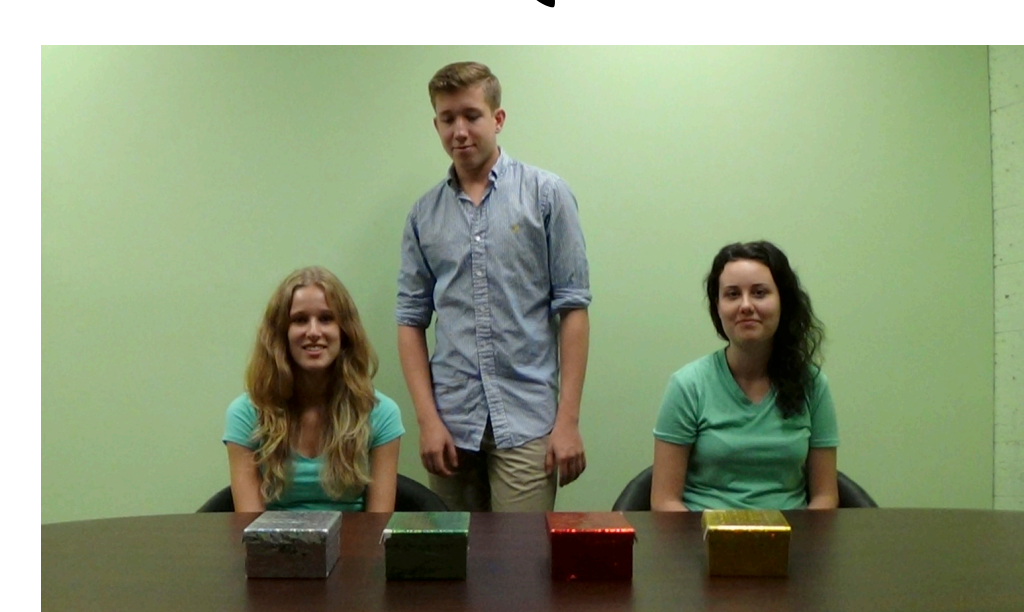
- **Did Amanda and Emily get to see inside the boxes?**
- **Did Amanda/Emily know what was inside the boxes?**
- **Who do you think is smarter?**

Model identity (i.e, which model was confident), speaking order, and novel labels each model provided were counterbalanced.

Does looking lead to knowing?

Models' Knowledge of Box Contents
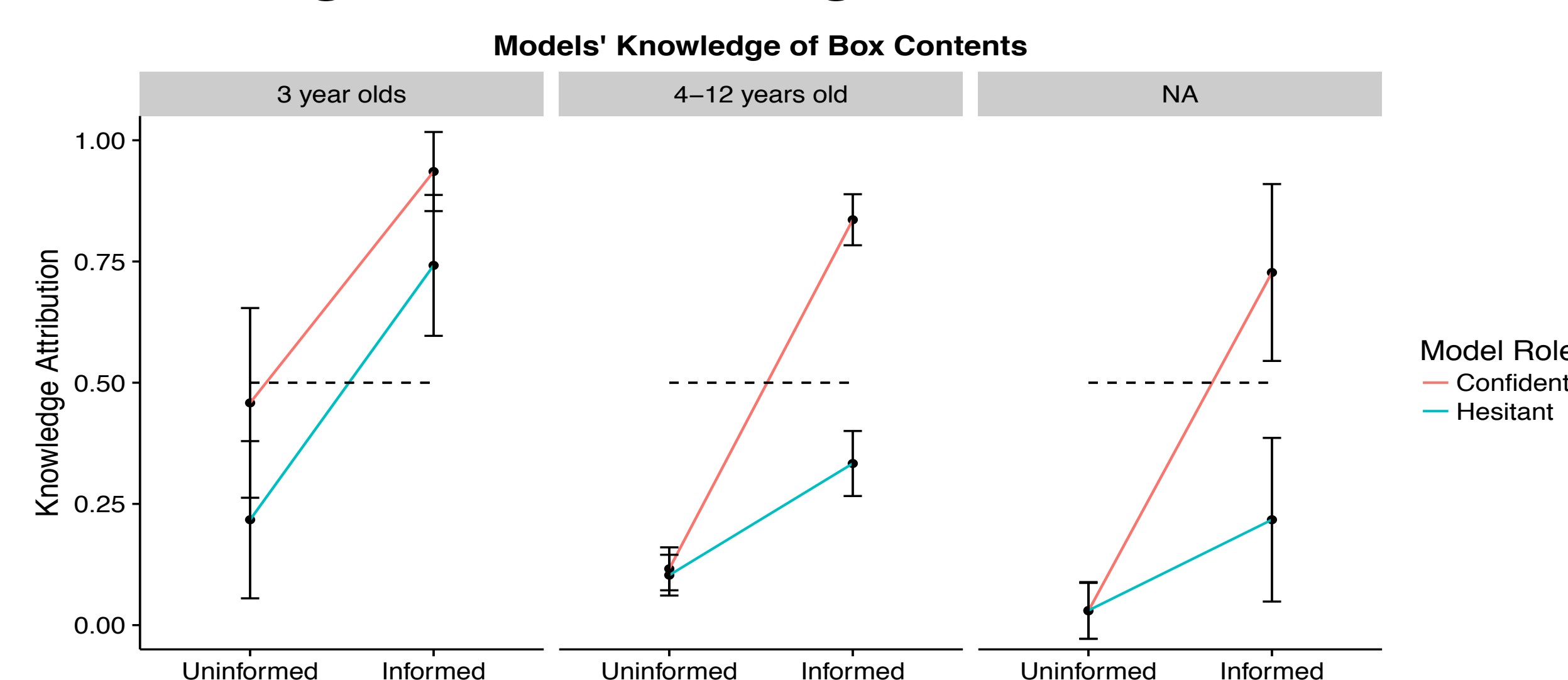
Confidence level x condition interaction (Random-intercept logistic regression, OR = 43.03, .95CI = [24.31, 76.17], *p* < .001)

Who do children and adults prefer to learn from?

Children and **adults preferred to learn from the confident model when her confidence is justified** (i.e., she's informed).

- Adults (OR=3.92, .95CI=[1.54, 9.98], *p* < .01)
- Children (OR=1.22, .95CI=[1.07, 1.40], *p* < .01)*
  *no effects of age, sex, or trial type

Who do children and adults think is smarter?

- Adults judged the **confident model as smarter** in the **Informed** (*M* = .58, *SD* = .50) compared to the **Uninformed** Condition (*M* = .15, *SD* = .36), *t*(39) = -3.64, *p* = .001, *d* = 0.99.
- Children became increasingly skeptical of the unjustifiably confident model with age (OR=1.24, .95CI=[1.04, 1.48], *p* < .05).
- At **age 6 children begin to significantly diverge** in their judgments that the confident model is smarter based on whether her confidence is justified.


Probability of Judging the Confident Model as 'Smarter'
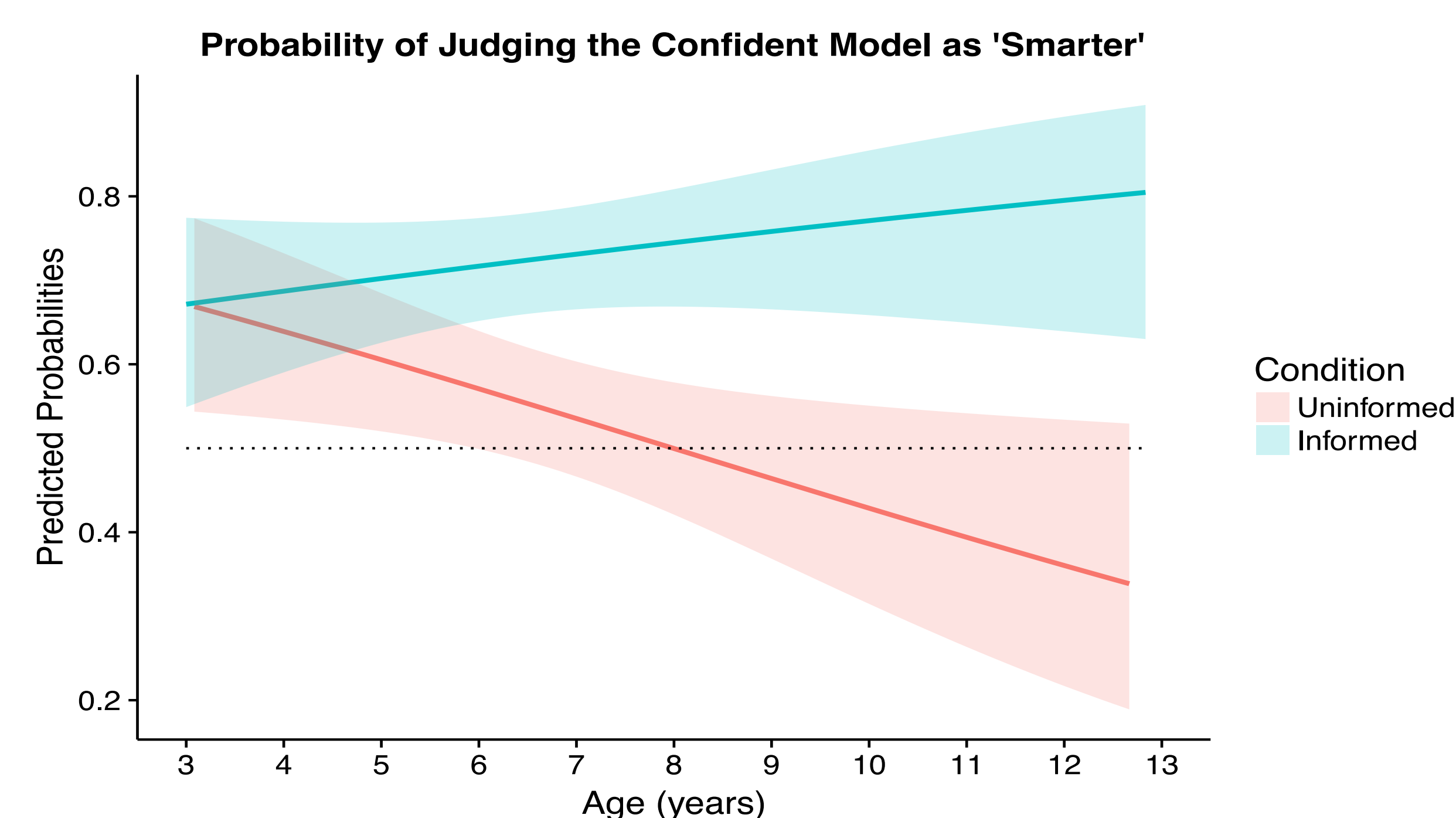
Shaded area = 95% confidence intervals. Dashed line indicates chance.

Experiment 2: Justified vs. Unjustified Confidence

N=63 children 4-8 years

History Phase: Two **confident** models.
One model was informed (justified confidence), the other was uninformed (unjustified confidence).

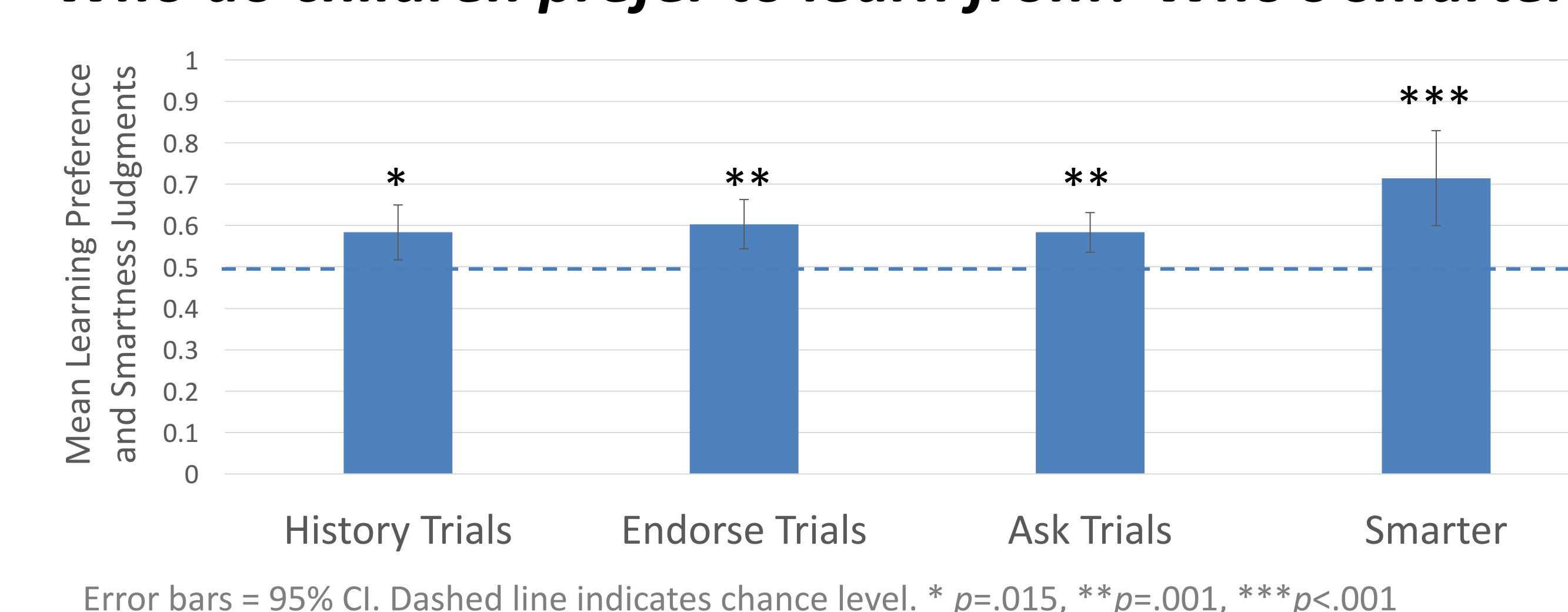Justified Confidence (Shown Contents)   Unjustified Confidence (Not Shown Content)
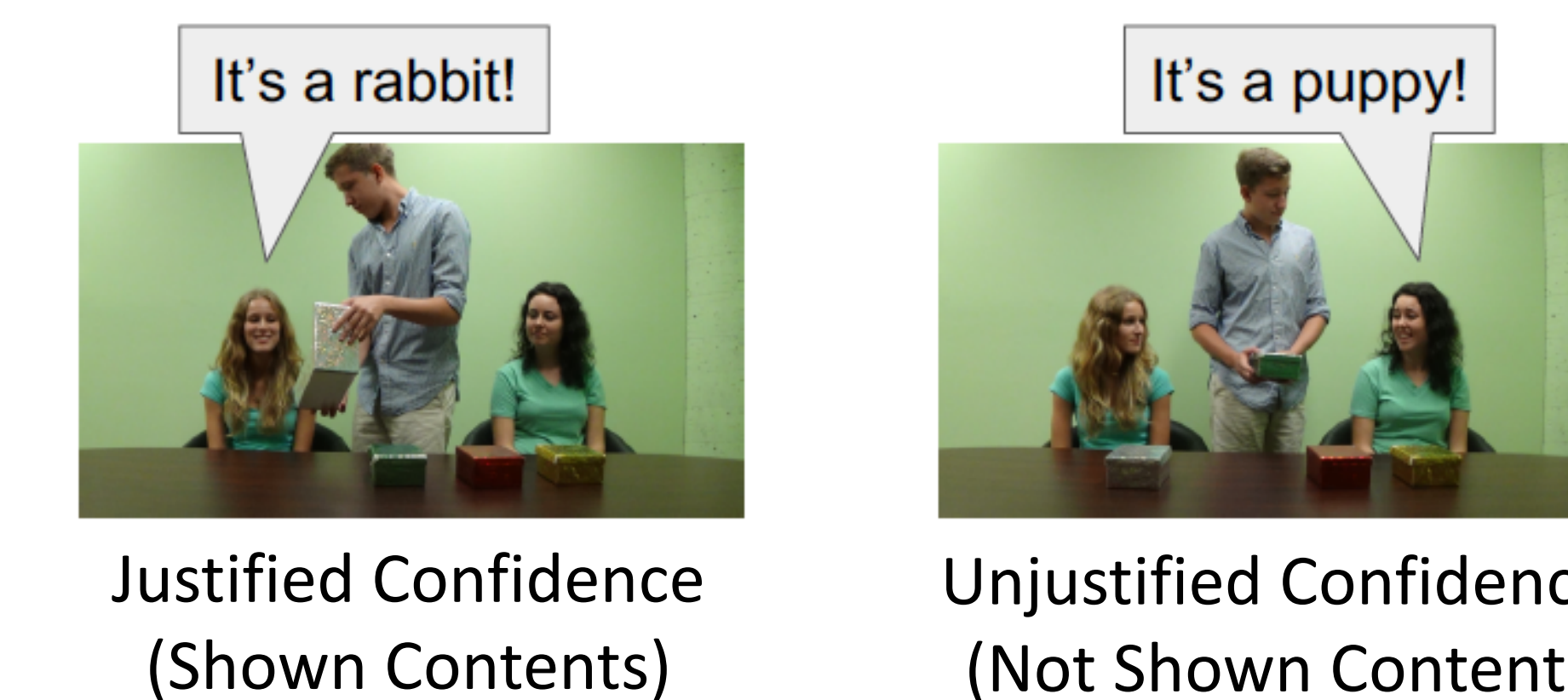
Test Trials: same as Experiment 1

Does looking lead to knowing?

- **88.7%** said informed model was knowledgeable
- **13.1%** said uninformed model was knowledgeable of the boxes' contents
t(59)=11.43, *p*<.001

Who do children prefer to learn from? Who's smarter?

Error bars = 95% CI. Dashed line indicates chance level. * *p*=.015, ***p*=.001, ****p*<.001

Experiment 3: Justified vs. Unjustified Hesitance

N=66 children 5-8 years

History Phase: Two **hesitant** models.
One model was informed (unjustified hesitance), the other was uninformed (justified hesitance).

Unjustified Hesitance (Shown Content)   Justified Hesitance (Not Shown Content)

Test Trials: same as Experiment 1

Does looking lead to knowing?

- **80%** said informed model was knowledgeable
- **40%** said uninformed model was knowledgeable of the boxes' contents
t(64)= 10.02, *p*<.001

Who do children prefer to learn from? Who's smarter?

Error bars = 95% CI. Dashed line indicates chance level.* *p*=.015, ***p*=.001, ****p*<.001
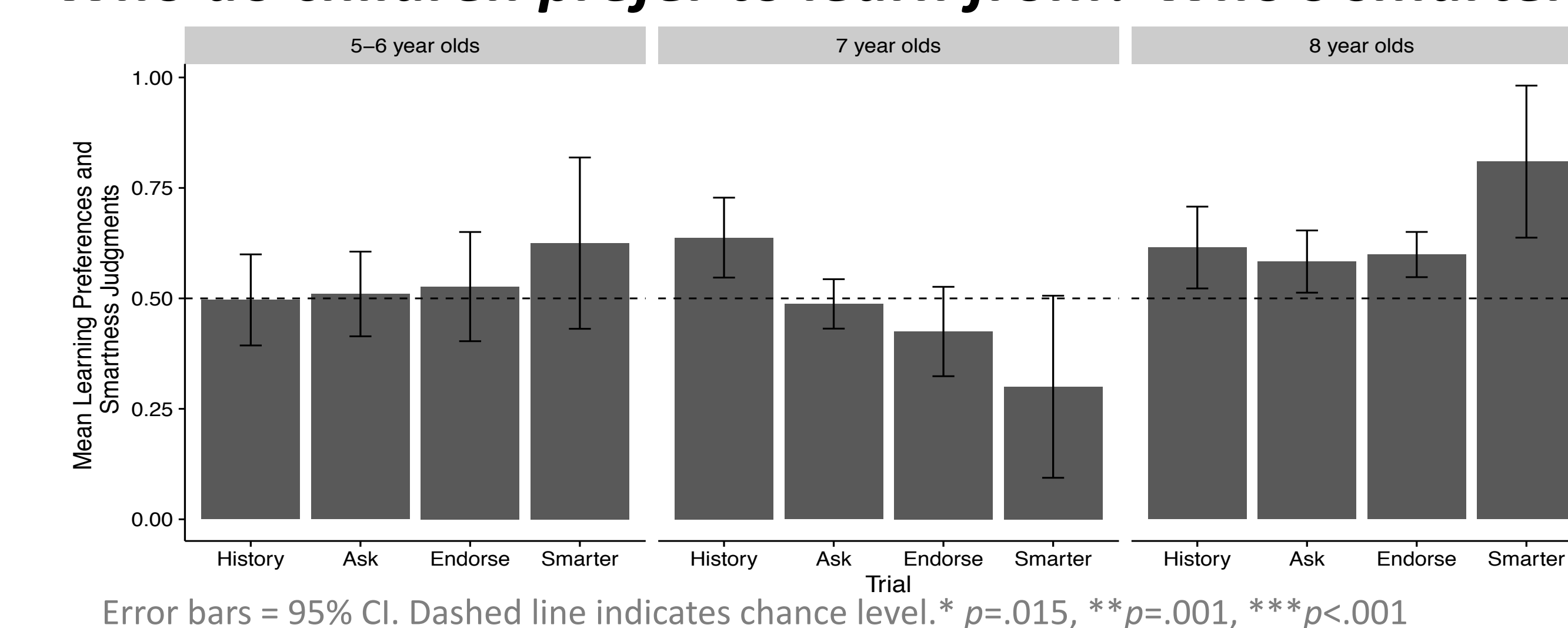
Discussion

The critical question of these studies was **whether children appreciate that one's level of confidence should be related to one's knowledge** when determining who is a credible source of knowledge.

- When confidence is justified by knowledge, **children across ages think the confident model smarter and prefer to learn from her** over an model who is also knowledgeable but lacks confidence. However, when confidence is unjustified by knowledge, **children become increasingly skeptical of the unjustifiably confident model in terms of her "smartness" and as a credible source of information** (Experiment 1).
- Although **by age 4 children avoid overconfident individuals** (Experiment 2), their **understanding of hesitancy appears to be a later developing** (Experiment 3).

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4. Danovitch & Keil, 2004
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