Early reasoning about agents' competence versus performance

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Background

• Efficient social learning requires judgments about other people's competence.
◦ Four- and five-year-old children can recognize competence; for example, they identify who is better at tower building using the speed of builders' actions and the qualities of building outcomes (Leonard et. al., 2019).

• But performance doesn't always reflect competence.
◦ Five-year-olds have some understanding of this distinction; after receiving testimonial information that a person is a good runner, children recognized that this person remains a good runner even if an unexpected event (tripping and falling) happened (Yang & Frye, 2016).

• However, little is known about young children's ability to make inferences about competence and performance from simple observation alone.

Research Questions

• *Do children have prior expectations about what kinds of agents are more competent at particular tasks?*

• *Do infants and preschoolers understand the influence of different temporary constraints on people's performance?*

References:
Leonard, J. A., Bennet-Pierre, G., & Gweon, H. (2019). Who is better? Preschoolers infer relative competence based on efficiency of process and quality of outcome. *Proceedings of the 41st Annual Conference of the Cognitive Science Society.*
Yang, F., & Frye, D. (2016). Early understanding of ability. *Cognitive Development, 38*, 49-62.

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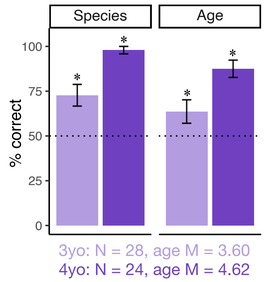
Expt. 1: Competence of Agents

What are preschoolers' priors about agents' competence?

Task: Children guessed which agent did a better or worse job in two tasks (building towers and drawing pictures).



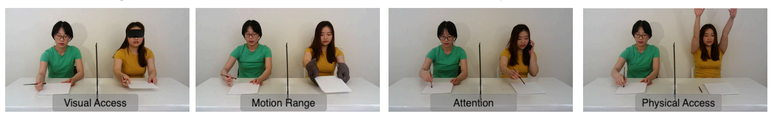
3yo: N = 28, age M = 3.60
4yo: N = 24, age M = 4.62

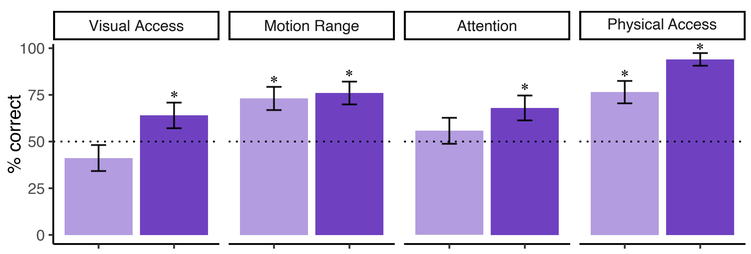
Three- and four-year-old children expect better performance from humans compared to animals, and adults compared to children.

Expt. 2: Recognizing Performance Constraints

Do preschoolers recognize the influence of temporary constraints on people's performance?

Task: Children saw two people building towers or drawing pictures, and then guessed who did a better or worse job.





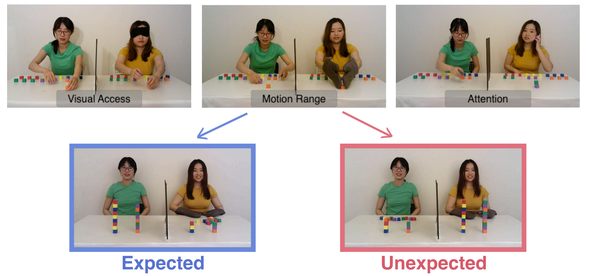
3yo: N = 28, age M = 3.60. 4yo: N = 24, age M = 4.62.

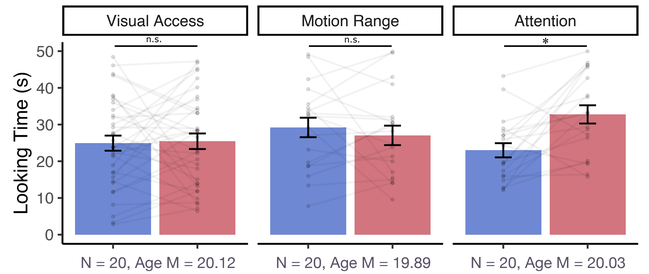
Four-year-olds understand the influence on people's performance of different constraints. Three-year-olds understand the influence of limited motion range and physical access.

Expt. 3: Recognizing Performance Constraints

Do infants expect people's performance to be affected by temporary constraints?

Task: Infants watched two people building towers behind occluders. Then occluders were lifted to reveal Expected and Unexpected Outcomes.





N = 20, Age M = 20.12 | N = 20, Age M = 19.89 | N = 20, Age M = 20.03

Twenty-month-olds expect limitations in attention (talking on the phone) to affect agents' performance.

Conclusions

• Three- and four-year-olds expect that agents will perform differently depending on their species (human/ non-human) and age (adult/ child).

• Three- and four-year-olds can reason about performances given certain temporary constraints. Inferences about more fine-grained constraints are still developing in three-year-olds.

• Twenty-month-olds already expect that limited attention can affect people's performance. They may need more first-hand experiences to understand the influence of wearing mittens and blindfolds on people's performance.