

Effects of COVID-19 pandemic social isolation on children's Theory of Mind development

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Previous research has found that Theory of Mind (ToM) skills correlate with peer social skills (Peterson et al., 2015; Watson et al., 1999; *i.a.*). The COVID-19 pandemic presented a unique opportunity to observe if reduced peer social interactions affected children's ToM development.

METHODS

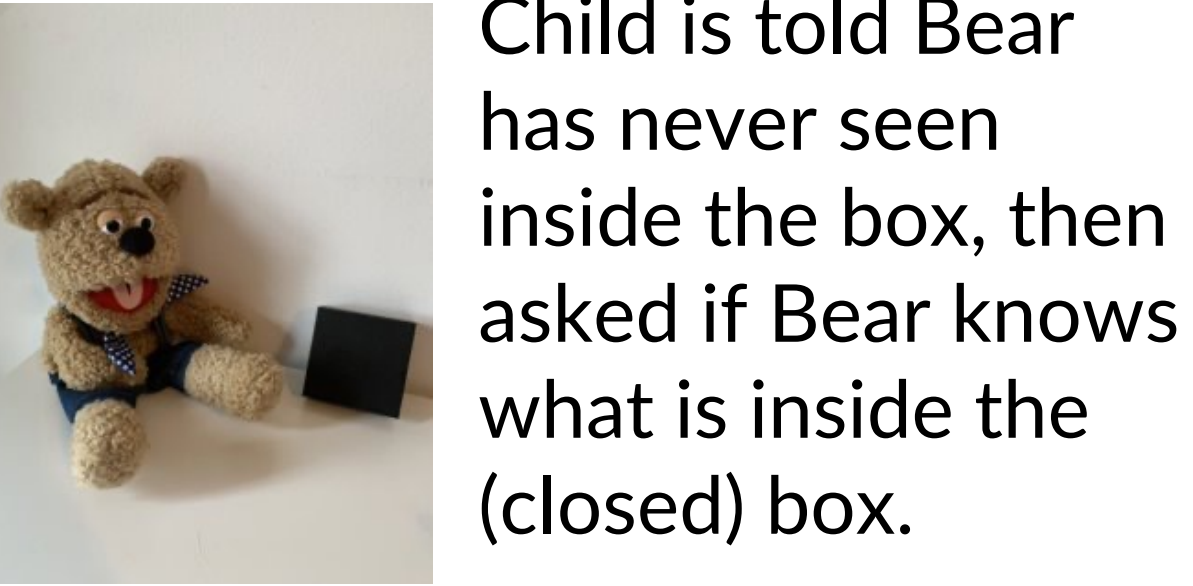
Participants
 • 33 children ages 3;2-7;8, tested between May and August 2021

Materials

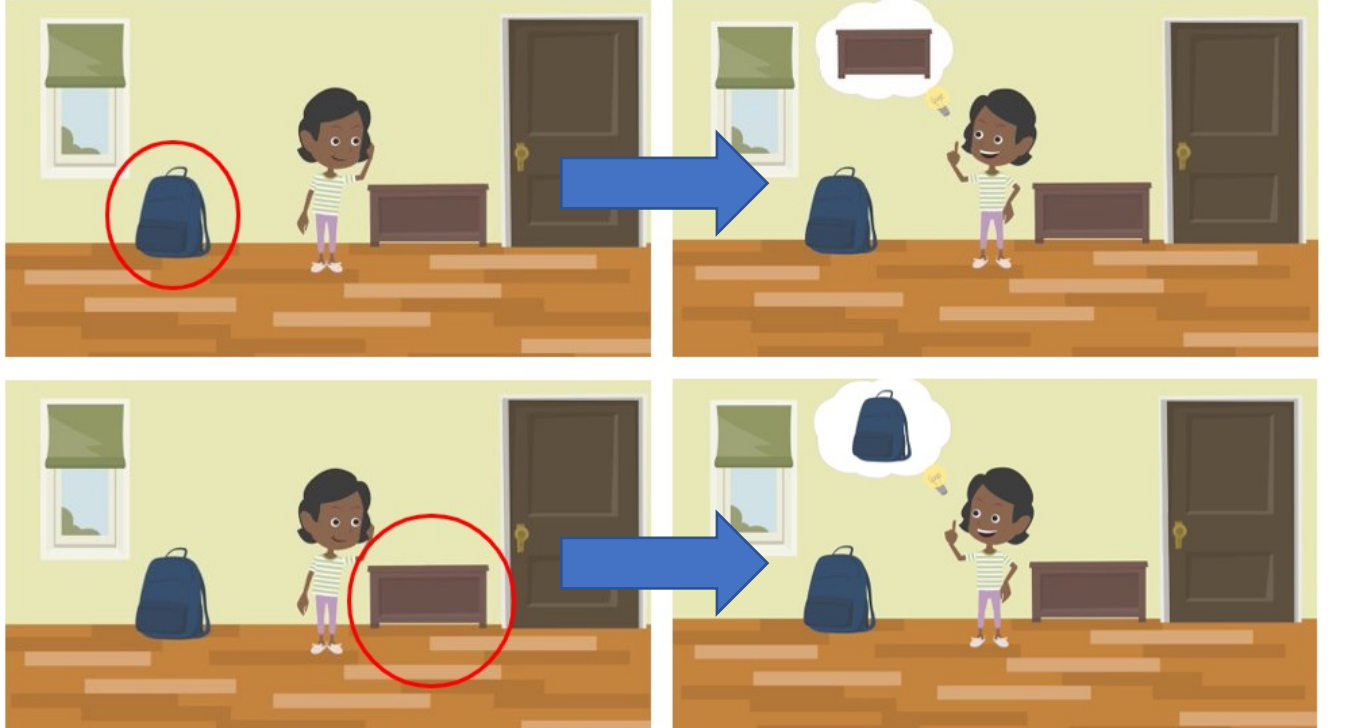
- Parents completed a questionnaire asking about their child's:
 - Siblings/peers living in their household
 - Gap in school/daycare attendance due to the COVID-19 pandemic
 - In-person interactions with peers outside their household before and after March 2020

- Children completed four Theory of Mind tasks, based on the Wellman & Liu (2004) scale:

Knowledge Access



Diverse Belief



Child is asked where they think Amelia's book is, then told Amelia thinks it's in the other location. Child is then asked, *Where will Amelia look for the book?*

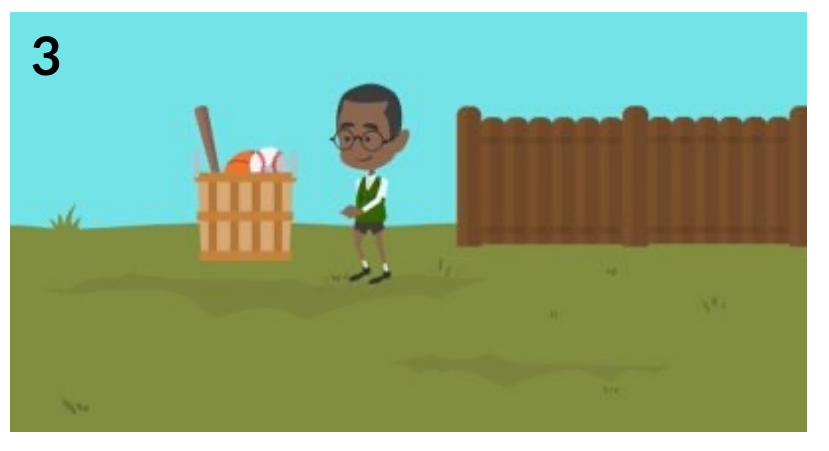
False Belief



1 Sam and Nina are playing catch.



2 Sam throws the ball behind the fence. Nina goes inside.

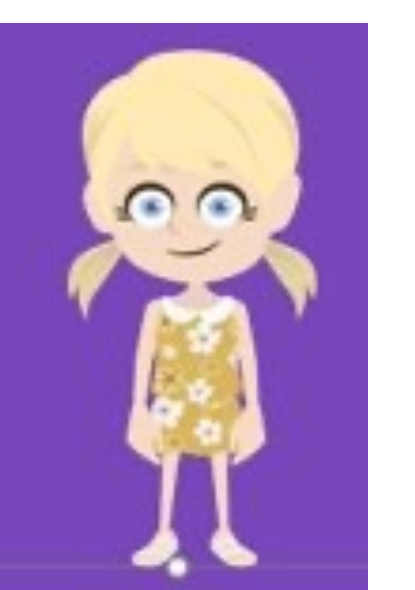


3 Sam puts the ball in the basket.



4 *Where will Nina look for the ball?*

Real-Apparent Emotion (3 stories)



Anna wants to go to her friend's party, but she has a tummy ache. If she tells her mom that she has a tummy ache, Mom won't let her go to the party. Anna tries to hide how she feels so that her Mom will let her go to the party. *How did Anna really feel? How did Anna look?*

Children's social interactions with non-sibling peers may not play a major role in their basic Theory of Mind development.*

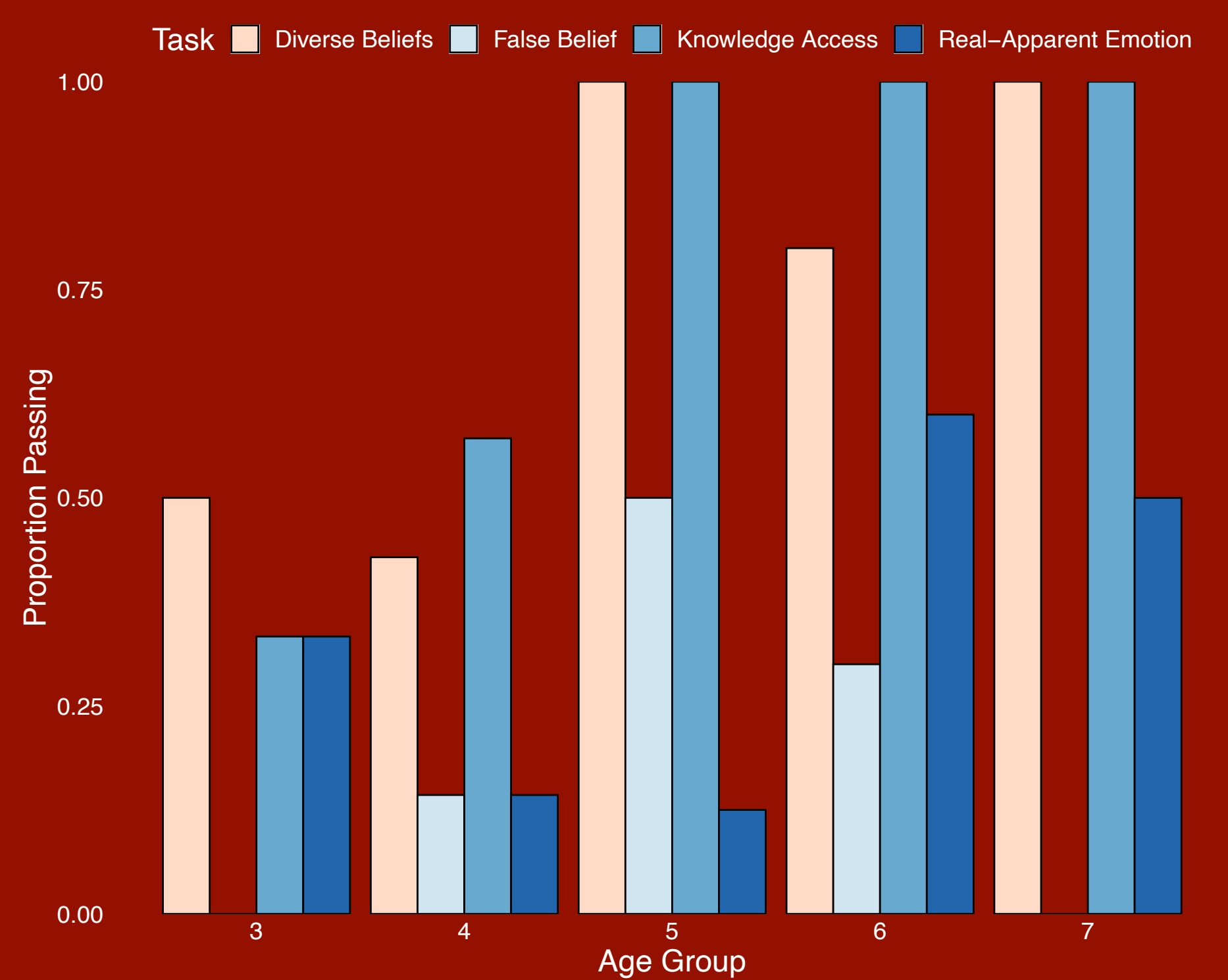


Fig. 1. Proportion of children that passed each of the four ToM tasks by age group.

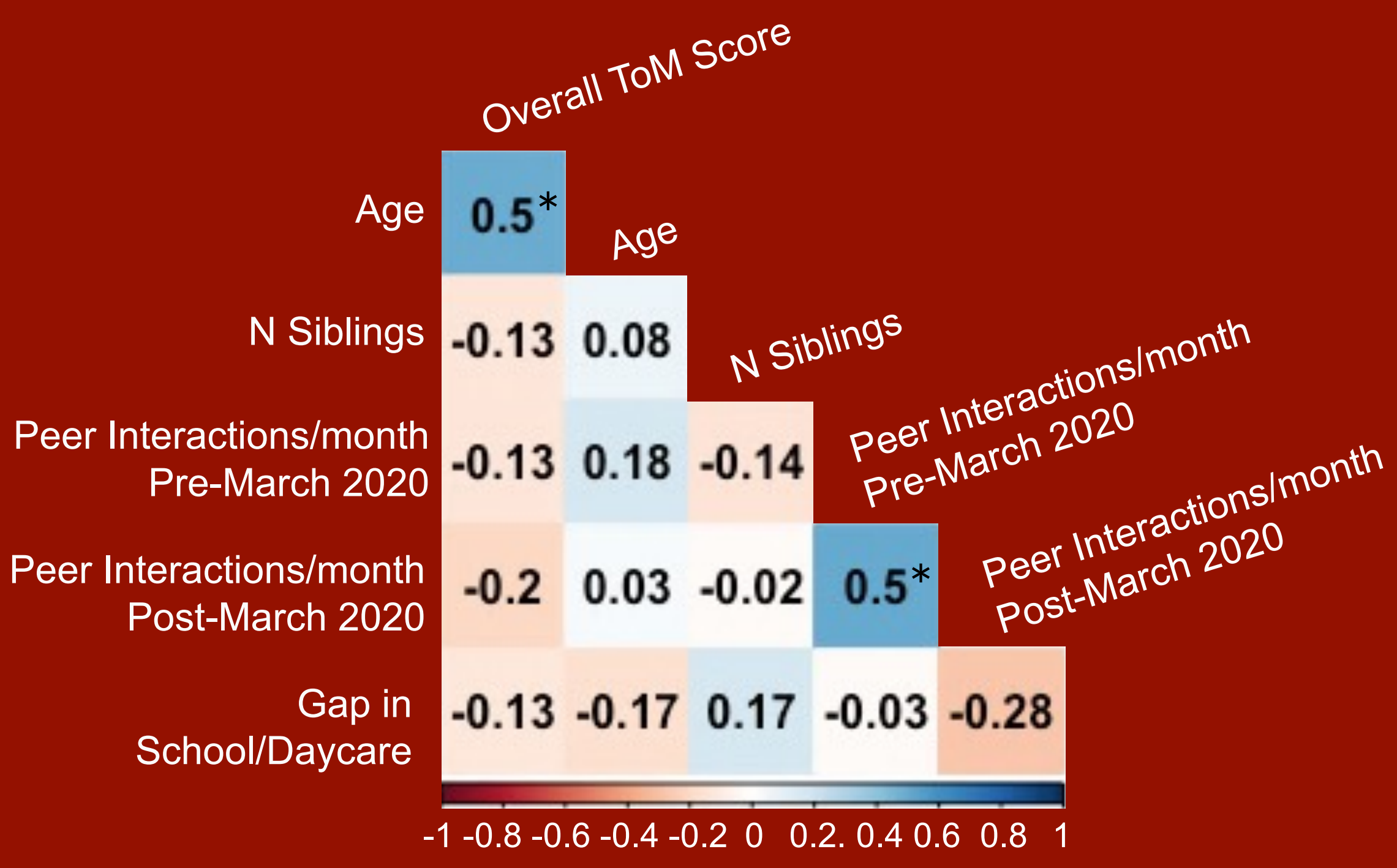


Fig. 2. Correlation matrix showing Pearson's *r* values for correlations between overall ToM score, age, and four social interaction metrics. * $p < 0.01$

	Estimate	Std. Error	t-value	<i>p</i>
(Intercept)	0.17	0.31	0.56	0.582
Age	0.12	0.04	3.32	0.003*
Siblings (Yes/No)	0.12	0.13	0.92	0.364
Number of Siblings	-0.06	0.06	-1.01	0.323
Older Sibling(s) (Yes/No)	-0.05	0.11	-0.44	0.660
Gap in school/daycare attendance	0.00	0.00	-1.12	0.273
Care hours/week after March 2020	-0.01	0.01	-0.99	0.329
Peer interactions/month after March 2020	-0.03	0.02	-1.55	0.132

Table 1. Linear regression model details for predictors of children's overall ToM score. Whether a child had Siblings or Older Siblings was coded as 0 (No) and 1 (Yes).

RESULTS

- Age was the only significant predictor of overall ToM task performance, computed as the proportion of tasks passed (Table 1; Figure 2).
- ToM task performance (overall and for individual tasks) was not predicted by
 - time spent out of in-person school or daycare
 - number of peer social interactions per month

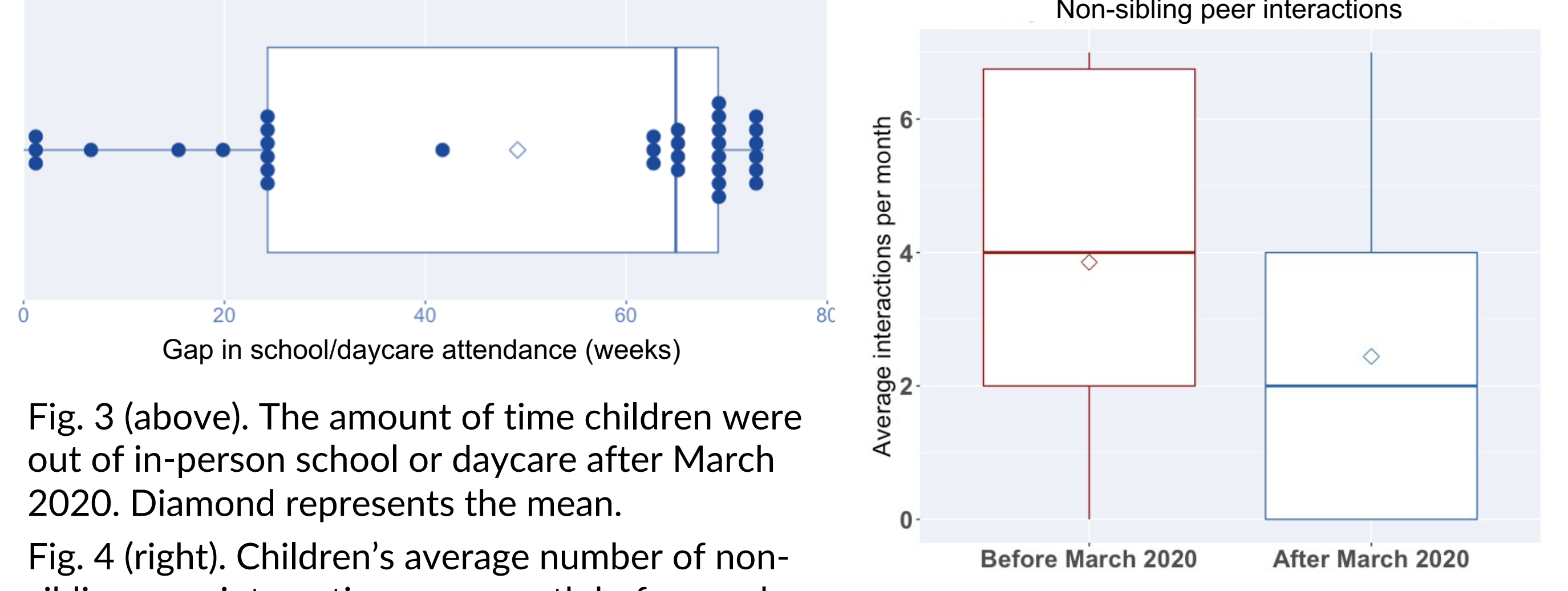


Fig. 3 (above). The amount of time children were out of in-person school or daycare after March 2020. Diamond represents the mean.
 Fig. 4 (right). Children's average number of non-sibling peer interactions per month before and after March 2020. Diamond represents the mean.

META-ANALYSIS COMPARISON

We compared the performance of children in our study to that of children on the same tasks in 39 previous studies. There were significant differences only for the False Belief task.



Fig. 5. Percent of participants providing correct answers by age for the 4 ToM tasks, for previous studies (red) compared to the current study (blue).

DISCUSSION

- Young children may not require extensive (in-person) interactions with similarly-aged peers in school or other settings to develop early basic ToM skills, as measured by classic tasks.
- Siblings may play a more significant role for young children, consistent with previous research (e.g., McAlister & Peterson, 2013; Perner, Ruffman, & Leekam, 1994; *i.a.*)
- *Caveats:
 - Limited sample size
 - Only children may be more affected by social isolation, but our sample had just 1 only child.
 - Some social measures had marginally significant effects on performance on the false-belief task; effects may have been more robust with a larger sample.
 - Care hours post-March 2020 ($\beta = -0.21$, $SE = .13$, $p = 0.1$)
 - Peer interactions post-March 2020 ($\beta = -0.5$, $SE = .28$, $p = 0.07$)
 - Other aspects of ToM development may be impacted by reduced social interactions with peers.

REFERENCES

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