

Does behavioral synchrony affect children's sharing, mentalizing, and social attributions to social robots?

INTRODUCTION

This study examined children's behavioral synchrony with human, robot, and metronome partners and the tendency to prefer, mentalize, and ascribe sociality to synchronous and asynchronous others.

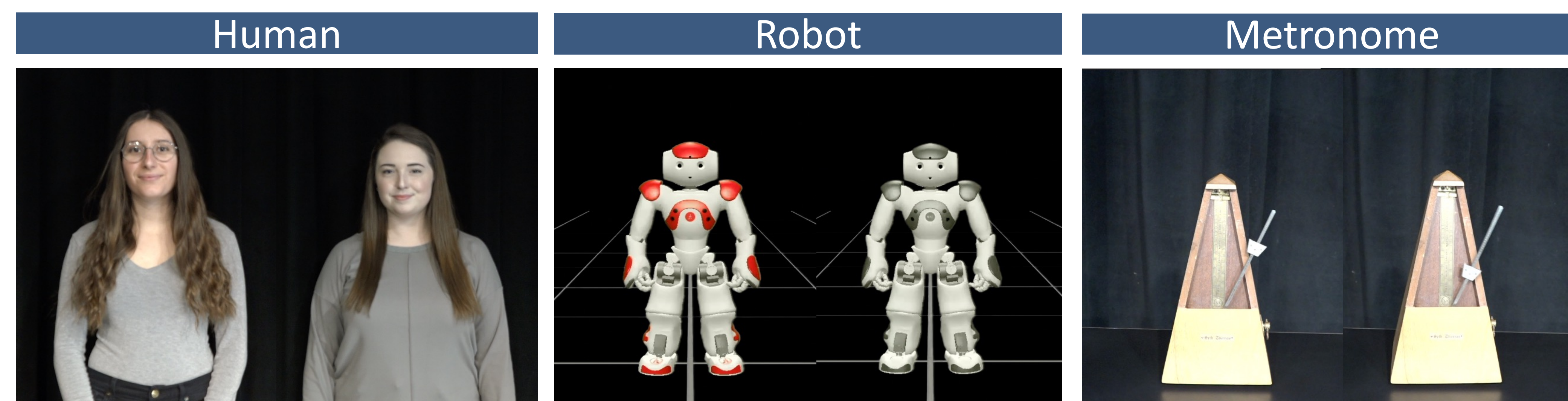
- Synchrony has many prosocial benefits: Promoted helpfulness and increased perceived similarity and closeness among children [1,2,3]
- Children demonstrate a preference for synchronizing with humans, rather than a machine [4]
- "Moving in *time* = moving in *mind*" [5]
- Children attribute mental states and sociality to robots [6]

METHOD

Participants

$N = 104$ ($N = 120$ planned) 5-8-year-olds ($M = 7.09$, $SD = 1.16$; 53% female; 77% white)

Conditions (between-subjects via random assignment)



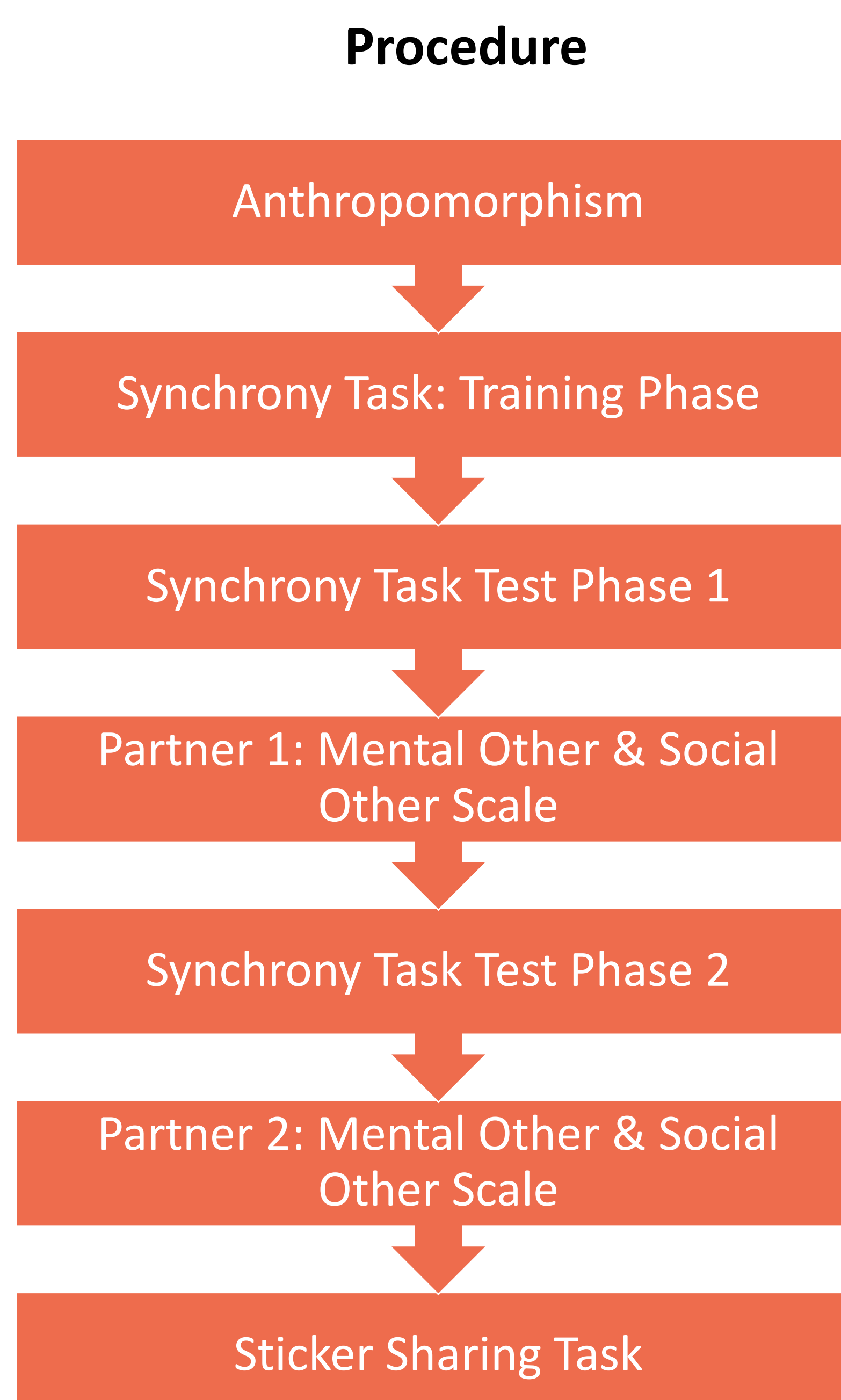
Within-Subjects
(counter-balanced order)

Synchronous Partner clapped to 150 bpm
Asynchronous Partner clapped to 100 bpm

Measures

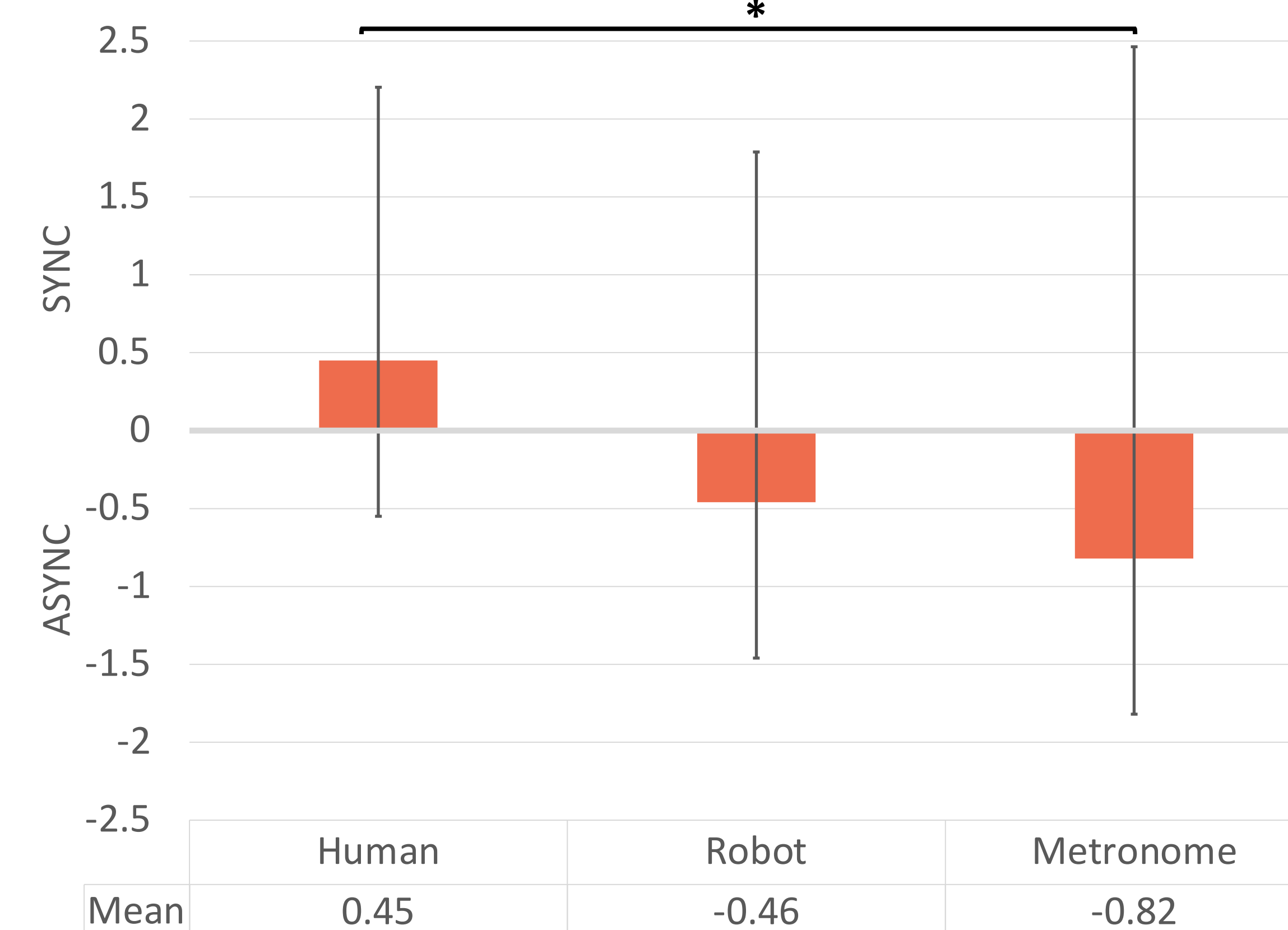
- **Individual Differences in Anthropomorphism – Child Form (12 items) [7]:** Assessed children's tendency to attribute human-like characteristics to non-human entities.
- **Mental Other Scale (5-items):** 4 questions adapted from the IDAQ-CF [7] and one item measuring "smartness" [8,9].
- **Social Other Scale (5-items):** Questions addressed friendship and likability [10], whether the child would comfort or spend time with the partner [7,8], and if the child enjoyed playing the clapping game with the partner.
- **Sticker Allocation:** Participants were given 7 stickers to take home, and a matching set of 7 stickers to distribute between the two partners.

Acknowledgments. This research was supported by a grant to S.S. from the Experiential Learning Scholarship Fund, University of Montana. * **Correspondence:** sarah.sweezy@umontana.edu



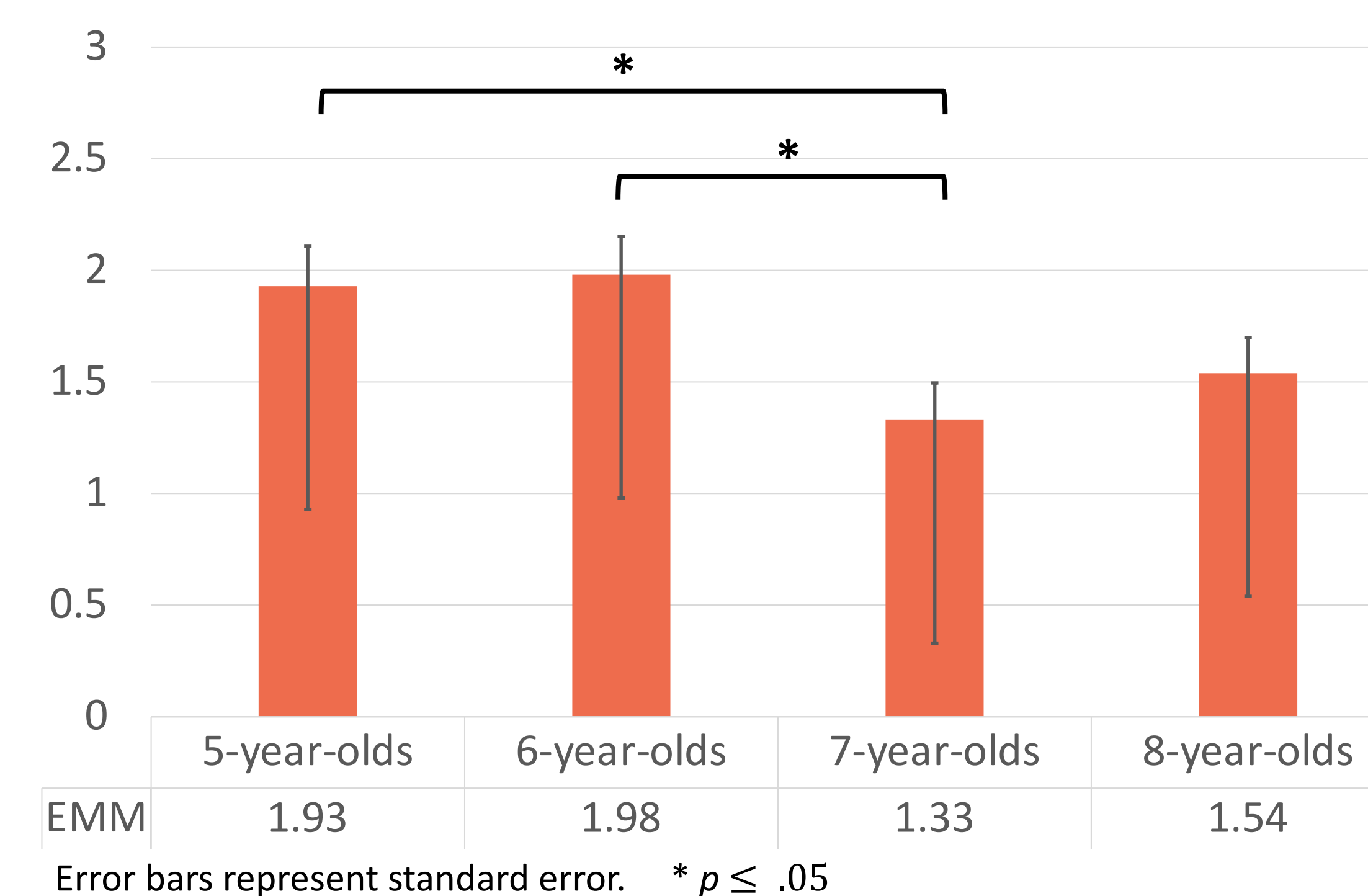
RESULTS

Figure 1. Mean sticker distribution (SYNC – ASYNC stickers) by agent.



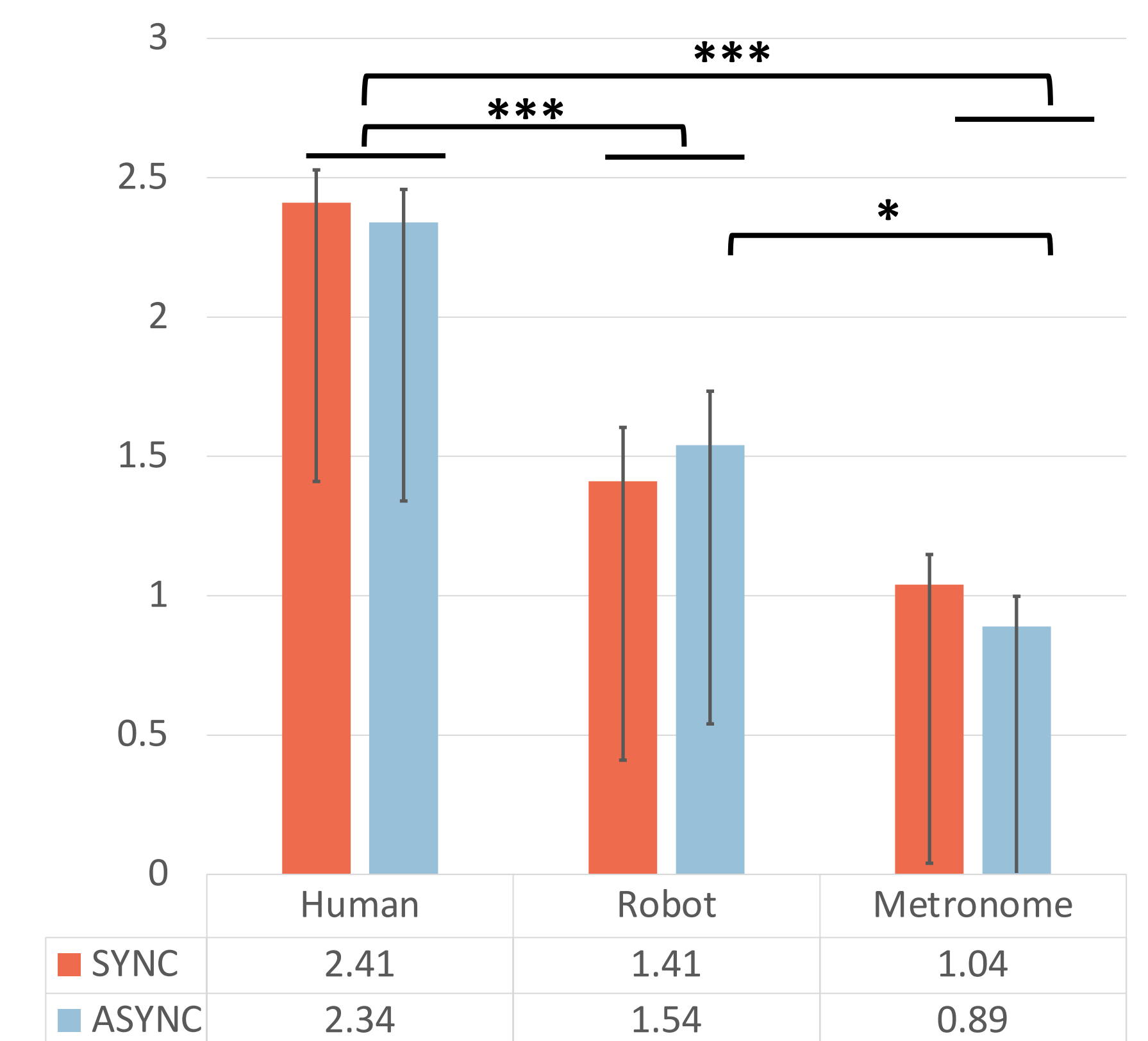
Error bars represent 1 SD. * $p \leq .05$
Note. Age was a significant main effect for the distribution difference ($p = .04$), such that 7-year-olds differed significantly from 5- and 6-year-olds ($ps < .03$).

Figure 3. Mean (EMM) Social Other score by age.



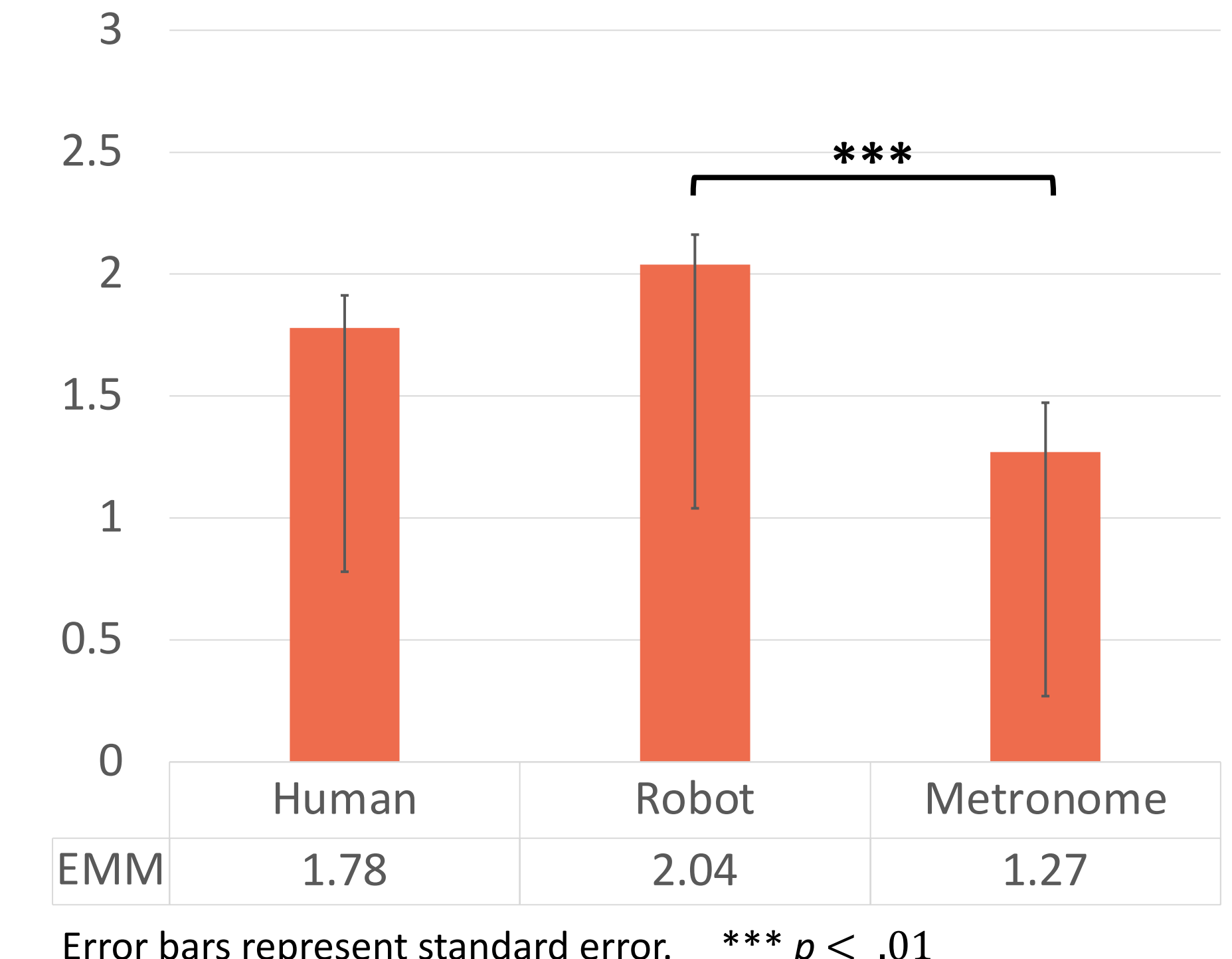
Error bars represent standard error. * $p \leq .05$

Figure 2. Mean (EMM) Mental Other score by agent.



Error bars represent standard error. * $p \leq .05$ *** $p < .01$

Figure 4. Mean (EMM) Social Other score by agent.



Error bars represent standard error. *** $p < .01$

CONCLUSIONS

Agent type affected preference to share with synchronous partner

- Preference for synchronous humans, but asynchronous metronomes.

Mentalizing was primarily influenced by agent type

- Children attributed highest level of mental states to humans followed by robots and the metronomes.

Social attributions were primarily influenced by age and agent type

- 6-year-olds attributed sociality across agents more readily than 7-year-olds
- Children attributed greater levels of sociality to robots compared to the metronome, whereas humans did not differ from either the robot or metronome.

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