

Background

- Joint attention is the mutual awareness of having attended to the same object or event between two (or more) individuals [1], allowing the exchange of information and goals in non-verbal cooperative activities without relying on verbal communication.
- Autistic children experience difficulties in joint attention [2], but the tasks used in the literature tend to focus on direct interaction that places additional cognitive demands such as tracking eye gaze and facial expressions. These requirements are demanding and sometimes even distressing to autistic children [3].
- Joint attention is understood in direct interaction, but it is not the only way children learn, it can be achieved when overhearing others [4].
- Autistic children find direct interaction challenging and traumatising [3], however whether autistic children would benefit more in joint attention in an overhearing than a direct environment remains to be tested.

Aims

- Assess the contribution of communicative environment to joint attention in a well-powered registered report lab study.
- Investigate whether joint attention in autistic children and neurotypical children differ when the task is in a direct environment and an overhearing environment.

Analysis Plan and Expected Results

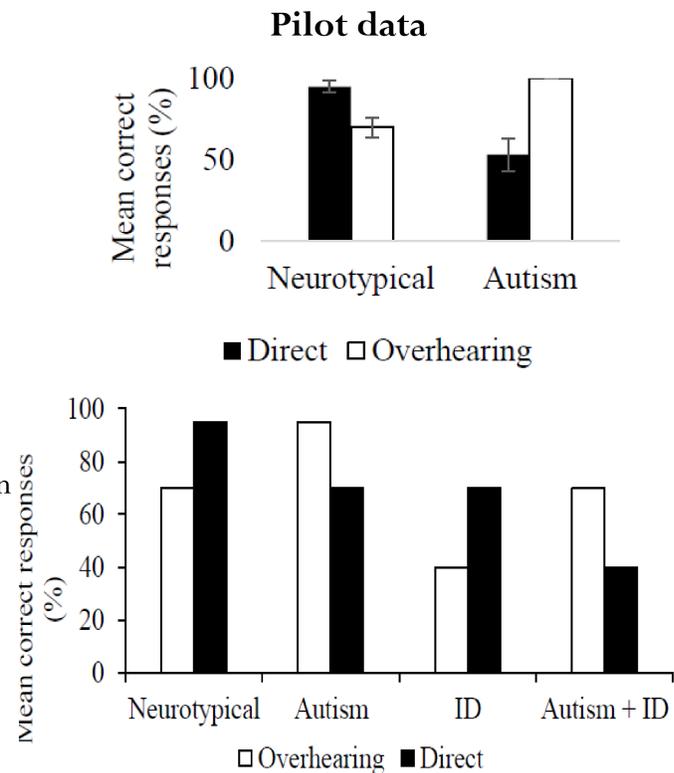
2 (communication: direct, overhearing) x 2 (group: neurotypical and autistic) x 2 (intellectual disability: ID or no ID).

General Linear Mixed model will be used on mean correct rate and inverse reaction times.

Pearson's correlation between Social communication questionnaire and direct **OR** overhearing object choice task.

We expect:

- Children with ID will perform worse at joint attention children without ID.
- Autistic children will perform better in the overhearing than in the direct condition.
- Children who are not autistic will perform better in the direct than in the overhearing condition.



Method

Direct object choice task [5] (N = 29 per group)



- Experimenter tells the child that they will hide the sticker under one of two containers and that the child's job is to find it.
- Experimenter hides reward in the container behind an occluder.
- Experimenter points at one container to indicate which container has the item. The child has to use this cue.

Overhearing object choice task [6] (N = 29 per group)



- Similar to the task above, but the experimenter is joined by a confederate.
- Experimenter tells the confederate they have hidden the sticker and point to container that they have hidden the sticker.
- The confederate looks confused, and the child is encouraged to help the confederate locate the reward.
- The experimenter does not engage or look at the child.

1st session

2nd session

The Autism Diagnostic Observation Schedules/Social Communication Questionnaire

Overhearing object choice task

Direct Object choice task

British Picture Vocabulary Scale (BPVS)

Leiter International Scale

References

- [1] Leavens, D., & Racine, T. P. (2009). Joint attention in apes and humans: Are humans unique?. *Journal of Consciousness Studies*, 16(6-7), 240-267. [2] Nyström, P., Thorup, E., Bölte, S., & Falck-Ytter, T. (2019). Joint attention in infancy and the emergence of autism. *Biological psychiatry*, 86(8), 631-638. [3] Kuperstein, H. (2018). Evidence of increased PTSD symptoms in autistics exposed to applied behavior analysis. *Advances in Autism*, 4(1), 19-29. [4] E., & Schieffelin, B. B. (1984). Language acquisition and socializations: Three developmental stories and their implications. In R. A. Shweder & R. A. LeVine (Eds.), *Culture theory: Essays on mind, self and emotion* (pp. 276-320). Cambridge: Cambridge University Press. [5] Clark, H., Elsherif, M. M., & Leavens, D. A. (2019). Ontogeny vs. phylogeny in primate/canid comparisons: A meta-analysis of the object choice task. *Neuroscience & Biobehavioral Reviews*, 105, 178-189. [6] Gräfenhain, M., Behne, T., Carpenter, M., & Tomasello, M. (2009). One-year-olds' understanding of nonverbal gestures directed to a third person. *Cognitive Development*, 24(1), 23-33.

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