From Spontaneous to Reflective Theory of Mind. How Do Gestures Render Development?

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INTRODUCTION

Rationale:

- social understanding or theory of mind (ToM) primarily emerges in interpersonal interactions with others; ToM ability is pragmatically or socially contextualized (for review: Froese & Gallagher, 2012; Liszkowski, 2013)
- participation in interactions (especially when children use pointing gestures) plays an essential role in the development of the ability to predict the behavior of others, i.e. ToM (Liszkowski, 2013)
- spontaneous (expressed with gazes) ToM precedes reflective (expressed with pointing and/or verbal answers) ToM in development (Clements & Perner, 1994)

Aims:

- is there a developmental transition from spontaneous ToM to reflective ToM before age 3.5 in a simplified, interactive False Belief Task (iFBT)?
- does the ability to use informative gestures at age 2 predict children's reflective ToM at age 3 and 3.5?

METHOD

Participants:

We analysed data from *N* = 174 (78 girls, 44.2%), tested three times: T1 (*M* = 23.94 months, *SD* = 0.38, *range* = 23.15–25.75), T2 (*M* = 35.51 months, *SD* = 0.48, *range* = 34.88–39.05) and T3 (*M* = 41.50 months, *SD* = 0.49, *range* = 40.03–44.01). The majority of the children were from urban areas within Poland (73.7%); more than half of parents were educated to university degree level (56.3%).

Task and Materials:

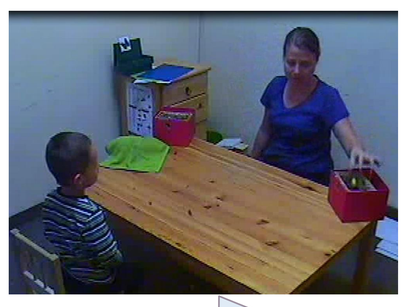
Illustrations (protoinformative pointing)
T1

Tester exposes small toys and **pictures** pertaining to them; she complains about the lack of picture related to one toy

Tester secretly activates the missing **picture** and waits for child's reaction

Interactive False Belief Task (iFBT)
T2 and T3

The mouse put the cookie into one of two boxes



The mause goes to sleep (under green blanket); Tester suggested that they make a surprise and put the cookie into second boxes

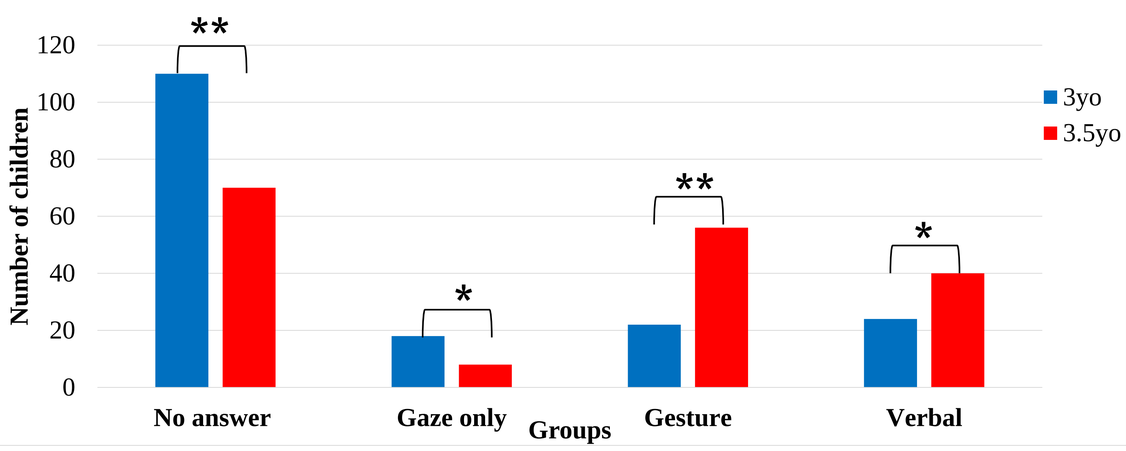
Tester asked a child: *Now a Mouse starts to look for her cookie. She has to look for it, where does she start to look?".*

RESULTS

Descriptive statistics of performance in iFBT

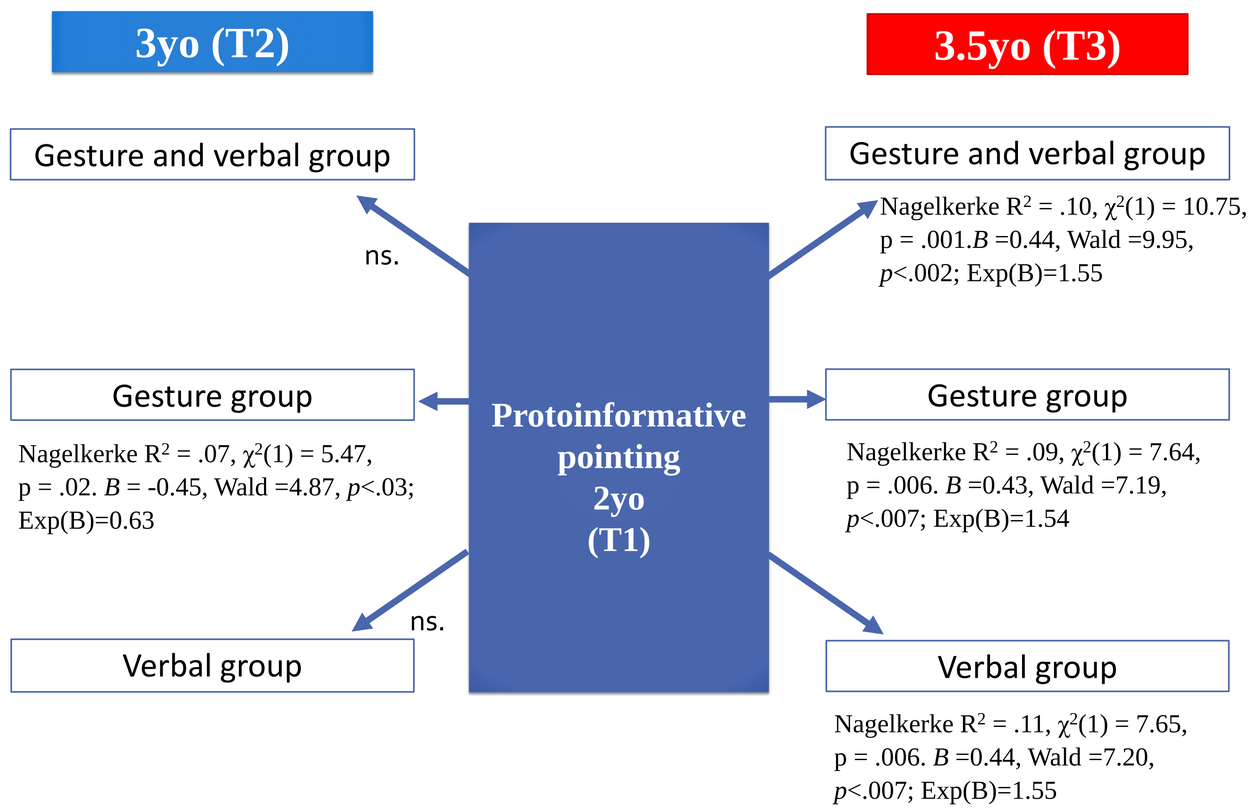
Group	3yo		3.5yo	
	N	%	N	%
No answer group	110	63.2	70	40.2
Gaze only group	18	10.3	8	4.6
Gesture group	22	12.6	56	32.2
Verbal group	24	13.8	40	23.0

Differences in performance in iFBT at T2 and T3



Note: * p<.05; **p<.01

Relation between informative pointing gesture at T1 (2yo) and performance of iFBT



DISCUSION

- In our study, we found evidence for developmental transition from spontaneous to reflective ToM between the ages of 3 and 3.5. In comparison to 3-year-olds, 3.5-year-olds more frequently passed interactive version of FBT verbally or by pointing, and less frequently used spontaneous gaze reaction exclusively.
- The ability to use protoinformative pointing gestures at 2 years of age predicts later reflective ToM. Precisely, it predicts only gesture answers in 3-year-olds; however, in 3.5-year-olds it predicts both gesture and verbal answers.
- We revealed that the ability to use protoinformative pointing gestures is longitudinally related to the ability to predict the actions of others; thus, we found preliminary support for a usage-based approach to ToM development (Froese & Gallagher, 2012; Liszkowski, 2013).

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