

Predictors of Implicit Theory of Mind

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Theory of Mind (ToM)

Research on the ontogenetic development of ToM is inspired by comparative studies and the evolutionary perspective:

- the term „ToM” was introduced by Premack and Woodruff (1978) in the research with chimpanzees
- Humphrey (1976): *The social function of intellect*
 - > the Machiavellian intelligence hypothesis (Byrne & Whiten, 1988)
- Vygotskian intelligence hypothesis (Moll & Tomasello, 2007)
- Richerson and Boyd (2005): initially evolved in the context of competition, but later started to fulfil other functions

Theory of Mind (ToM): explicit – implicit

- classical tests: false-belief (Wimmer & Perner, 1983), tactical deception (Sodian et al., 1991)
- however the research of the past 10 years ... (Onishi & Baillargeon, 2005; Southgate et al., 2007) > infants pass nonverbal ToM tests
- implicit – explicit (Low & Perner, 2012; Perner, 2010)

implicit ToM:

- spontaneous (automatic),
- fast and effective
- unverbalizable
(nonsymbolic orienting response)

explicit ToM:

- controlled, volitional
- slower, demands on EF
- verbal or gestural response

Predictors of ToM

Predictors of explicit ToM:

- older siblings (Ruffman et al., 1998), social background (Holmes et al., 1996; Hughes et al., 2005), culture (Callaghan et al., 2005; but: Mayer & Trauble, 2012)
- temperament
 - shy, non-aggressive children develop ToM earlier (Wellman et al., 2011; Mink et al., 2014)
 - > were inspired by the socio-emotional reactivity hypothesis (Hare & Tomasello, 2005)

Predictors of implicit ToM:

lack of research?

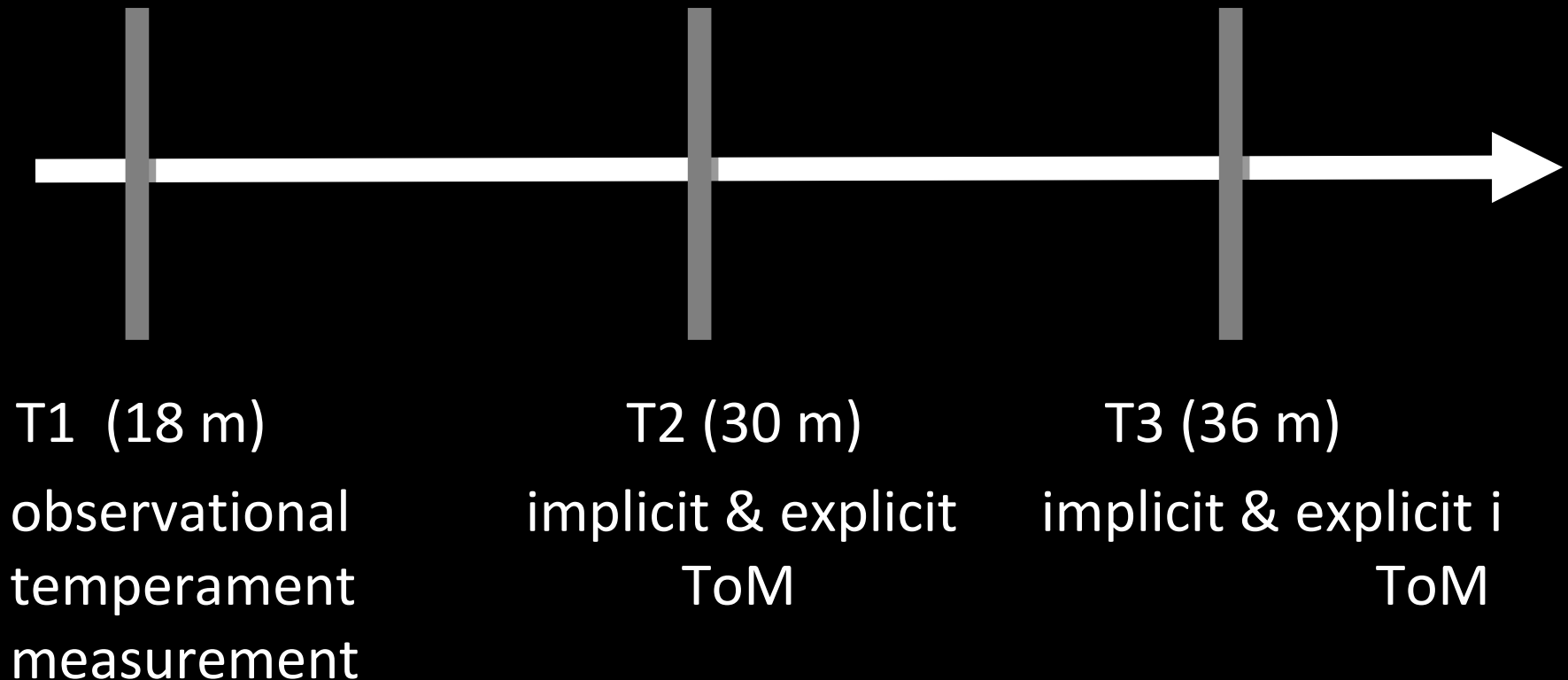
> similar to predictors of the explicit ToM? or on the contrary?

we try to answer to these questions

Subjects and method

- part of the project *The Birth and Development of Mentalising Ability*

- measurement



1. Temperament measurement

18 m

On the basis of Kagan et al. (1989):

- dimension :
inhibited – uninhibited
(shy – bold)

Child's reactions to unknown objects
(a loud alarm, a moving toy)

Categories of behaviour (i.a.):

- the latency for getting off the sofa,
approaching to the object (longer >
shyness; shorter > boldness)
- time of touching and remaining close
to the parent (longer > shyness;
shorter > boldness)
- behavior addressed to the parent
(more > shyness; fewer > boldness)

2. ToM measurement

30 & 36 m

On the basis of He et al. (2012): play of cutting out stickers

E1 leaves the scissors in the basket and leaves,
E2 enters, takes the scissors out of the basket

Covers her eyes, and wonders aloud

„But when Mary is back, she's going to need her scissors [pause], where will she think they are?“

> measure of child's spontaneous reaction
(implicit ToM)

E2 uncovers the eyes and addresses the child directly „Hmm, I wonder where Mary is going to look for the scissors?“

> measure of elicited reaction
(explicit ToM)

- precise measurement of the direction and duration of the gaze, pointing, statements

The target's container view

2. ToM measurement

30 & 36 m

Implicit ToM – only correct
spontaneous reaction

Explicit ToM – only correct
reaction after being directly
addressed by E2 (did not react
spontaneously)

Lack of ToM

Discussion

- **implicit ToM** (30, 36 m) was connected with a shorter latency time in approaching an unknown object and shorter time spent with the parent (18 m)
 - we have extended the knowledge > implicit ToM develops earlier in uninhibited (bold) children
 - coherent with evolutionary scenarios > fast and effective tracking of mental states of others should be connected with lack of inhibitions (boldness)
 - the implicit and explicit ToM – two-systems?
- **explicit ToM** (30, 36 m) was connected with a longer latency time in approaching an unknown object and more time spent with the parent (18 m)
 - confirmation of the results from earlier research (Wellman et al., 2011) > inhibited (shy), children develop explicit ToM earlier

- The implicit theory of mind develops earlier in bolder, less inhibited children

Thank you to the children and their parents for participating in the research

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