

**Early false belief understanding  
develops earlier in less inhibited  
children**

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# False belief understanding - 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

# Predictors of ToM

Investigating predictors is also inspired by comparative studies and the evolutionary perspective:

- the emotional reactivity hypothesis (Hare & Tomasello, 2005)
  - human forms of cognition and communication as a result of selection on the basis of a **low level of fear and aggression** towards humans
- temperament
  - shy, non-aggressive children develop ToM earlier (Wellman et al., 2011; Mink et al., 2014)

# Theory of Mind (ToM) ... but ...

## 1. explicit and implicit ToM

- classical tests: f-b (W&P, 1983), tact dcpt (Sodian et al., 1991)
  - but ... implicit theory of mind (Clements & Perner, 1994)
  - **children's looking in anticipation** of the reappearing protagonist
- even infants pass nonverbal ToM tests (O&B, 2005)

## 2. detached observer vs active participant

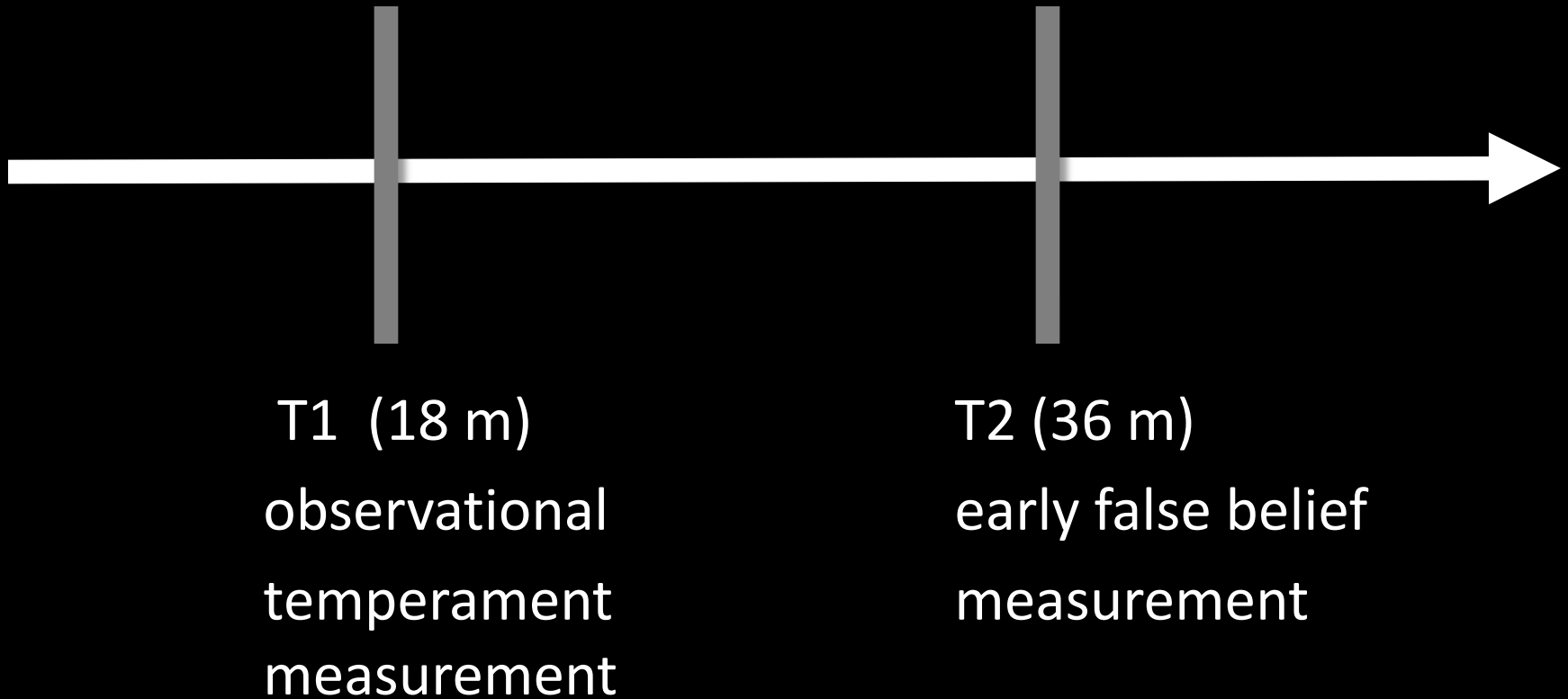
“3rd person” observations vs “2nd person” engagement

Are predictors of early or more interactional aspects of false belief understanding similar to predictors of explicit or „observational ToM“?

we try to answer to these questions > here: only temperament

# 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):

- presence and absence of a fear reaction
- 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
- time of touching and remaining close to the parent (total and proportion)
- behavior addressed to the parent

## 2. ToM measurement

36 m

On the basis of He et al. (2011): 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

Uncovers her eyes and addresses the child directly

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

## 2. ToM measurement

36 m

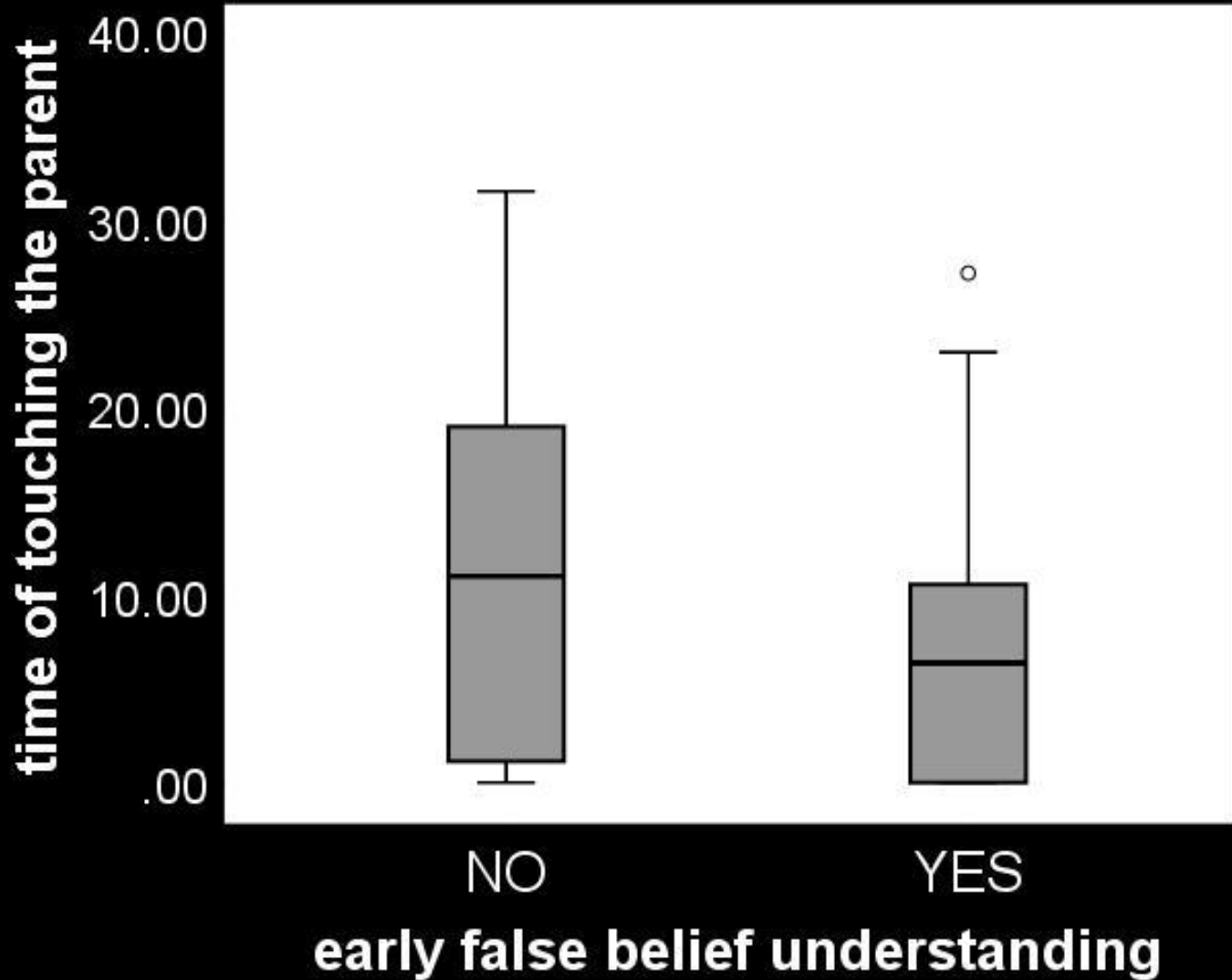
### Early false belief

**understanding** – only  
correct spontaneous  
reaction

(looked at the target container,  
didn't look at the non-target  
container, didn't refer to E2,  
didn't answer E2's direct  
question)



# Results



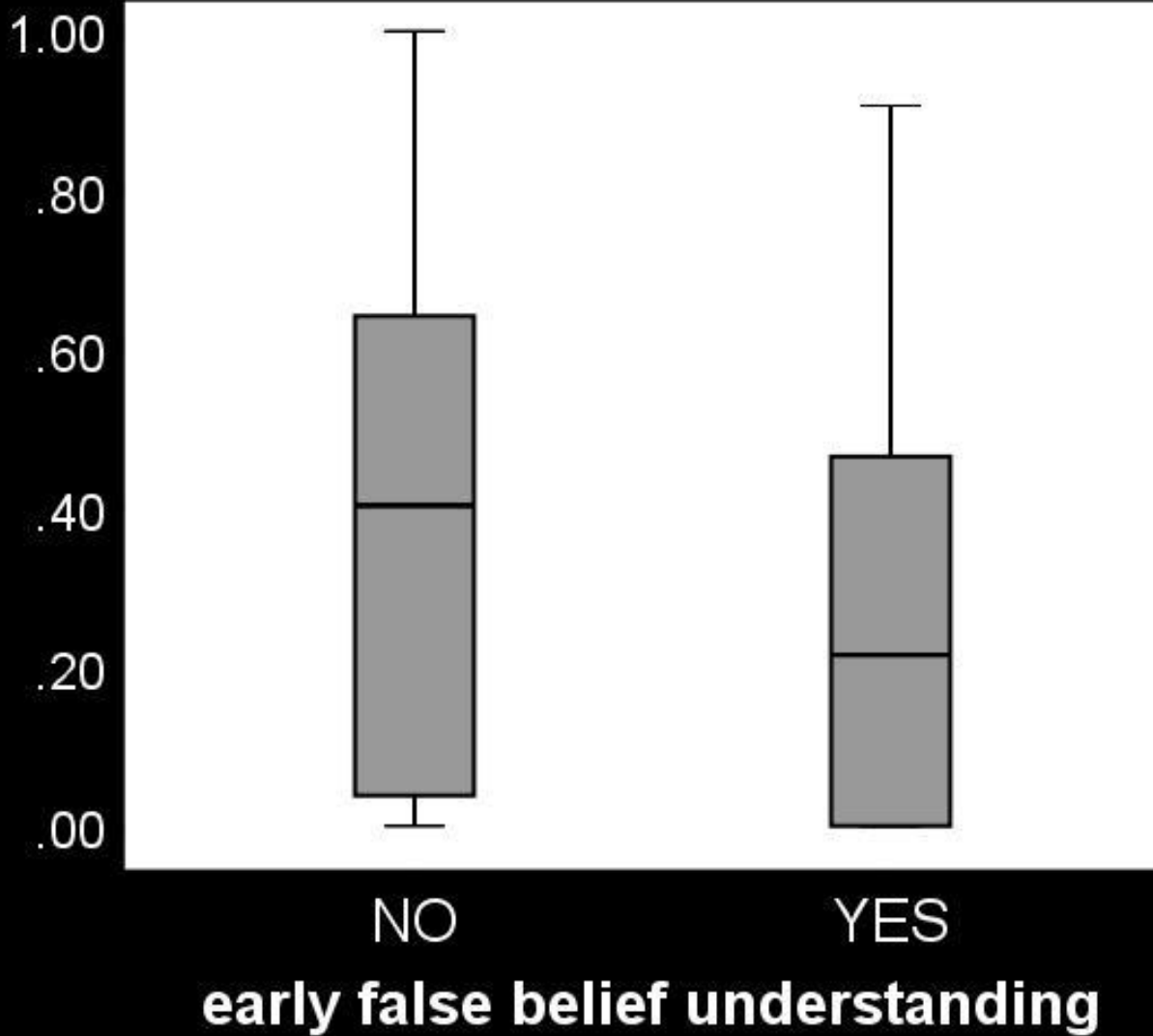
**$U = 2978,00$**

**$p = ,013$**

**$r = -0,173$**

# Results

propotion of time of touching  
the parent

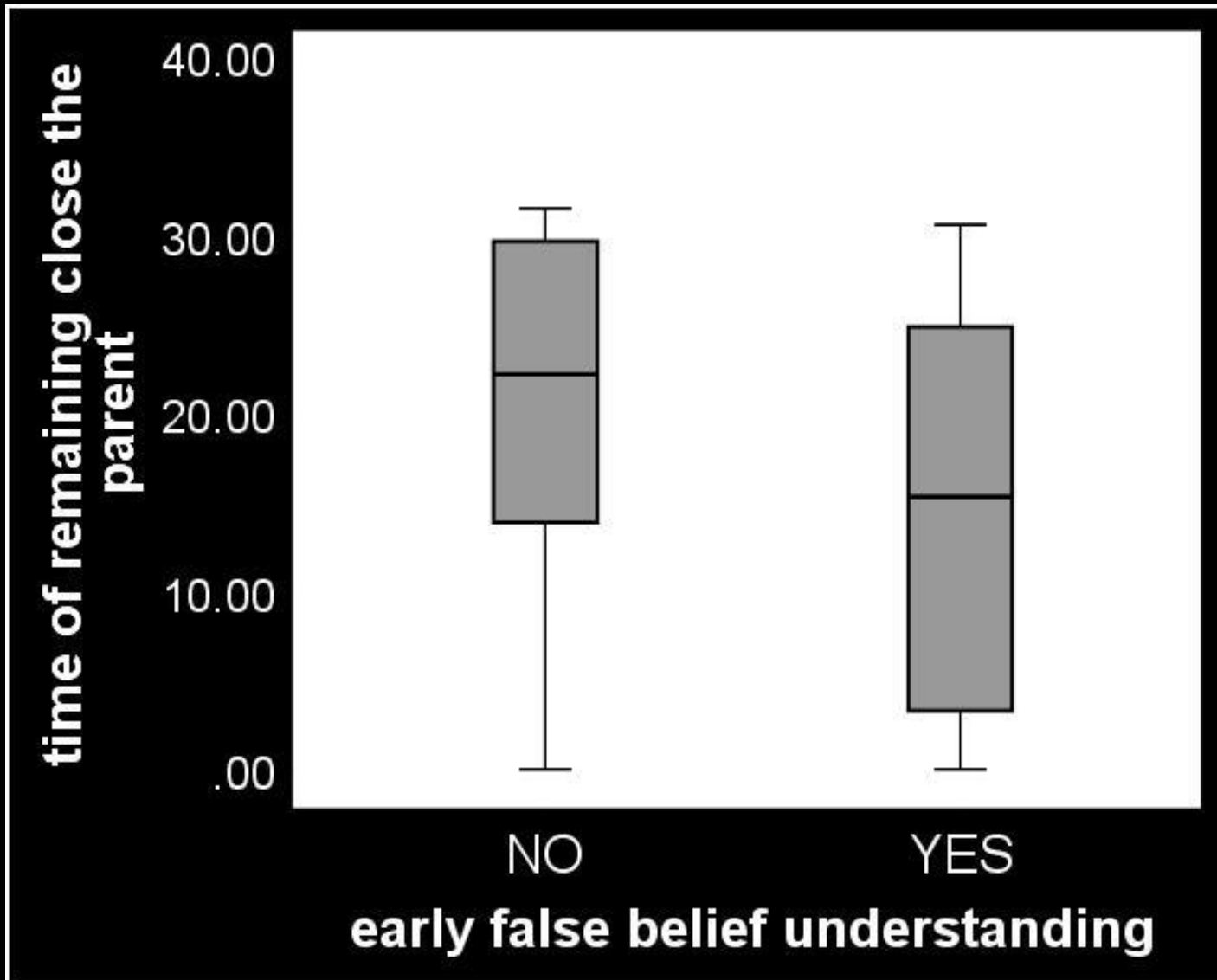


$U = 2981,00$

$p = ,014$

$r = -0,172$

# Results

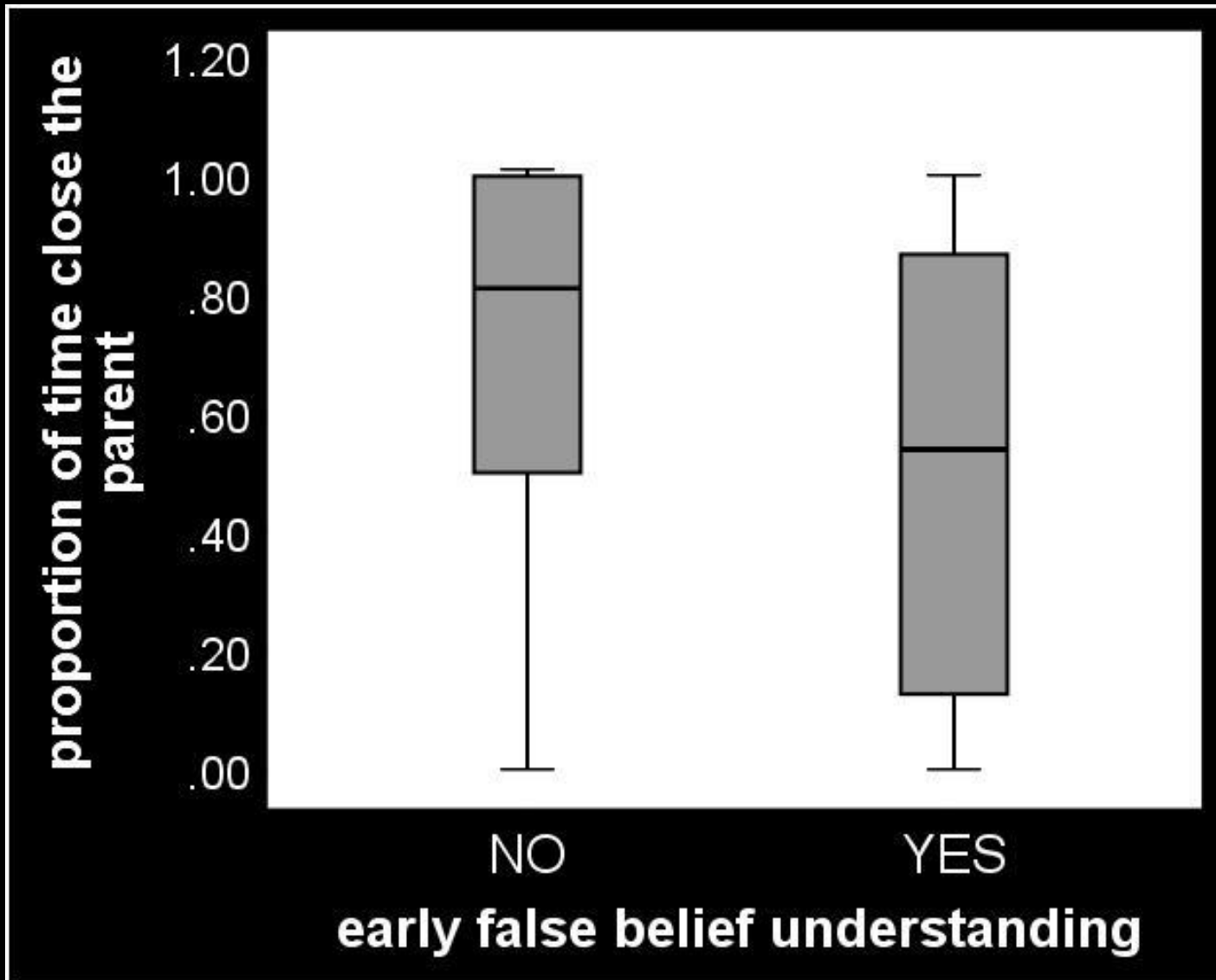


**$U = 2826,00$**

**$p = ,004$**

**$r = -0,201$**

# Results



$U = 2866,00$

$p = ,005$

$r = -0,194$

# Discussion

- early false belief understanding develops earlier among children who at a younger age reacted with a relatively smaller fear to unfamiliar, distressing objects
- in accordance with the expectations resulting from the emotional reactivity hypothesis (Hare & Tomasello, 2005)
  - > less fear is conducive to development of false belief understanding
- early and later ToM are different aspects of ToM:
- less fearful behaviour is conducive to the development of early false belief understanding,
- and shy, observant behaviour to development of verbal, deliberative false belief understanding
- differences in procedures: more active engagement in social interaction vs observations of vignettes
- so ... determinants of ToM depend on which aspect of false-belief understanding is being investigated and how it is done

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

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