

# Joint Attention, Joint Action and Language Development in a Child's Second Year

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# General framework: development of symbolic communication (Werner & Kaplan, 1963)

- in the course of development there is progressive **distancing** of e.g. the symbolic vehicle and object
- **reference arises in** its initial **nonrepresentational** form within a primordial sharing situation
- understanding representational relation > comprehending that the symbolic vehicle identifies its referent

distancing occurs in joint attention and joint action

pointing "introduces the referent into communication" (Werner & Kaplan, 2003)

determining of referent > redirection of addressee's attention

symbolized by linguistic symbols > the word identifies its referent and substitute it

# Joint attention (JA)

- triadic interactions, in which participants coordinate their attention to an object of mutual interest (Bakeman & Adamson, 1984)
  - **alignment of** adult's and infant's **attention**, e.g. gaze-following, pointing: protoimperative (requests, BR), protodeclarative (DP), protoinformative (IP)
- JA and language > JA plays a crucial role in children's acquisition of language (Bruner, 1983; Tomasello, 2008)
- example of research (Mundy et al., 2007): ESCS (12, 18 mths) and language (24 mths)
  - > RJA (12 mths) and IJA (18 mths) correlated with lang. comprehension

# Joint action (JAc)

- any form of social interaction whereby two or more individuals **coordinate their actions** in space and time to bring about a change in the environment (Sebanz et al., 2006)
- JA creates a "perceptual common ground" in JAc



coordination of  
**attentions**



coordination of  
**actions**

- particularly important > complementary forms of JAc ("meshing" of actions)
- JAc and language?  
"language use is a form of joint action" (Clark, 1996)
- but does JAc play a role in language acquisition?

# Conducted research – aims:

Specifying developmental relations between different manifestations of early child communication

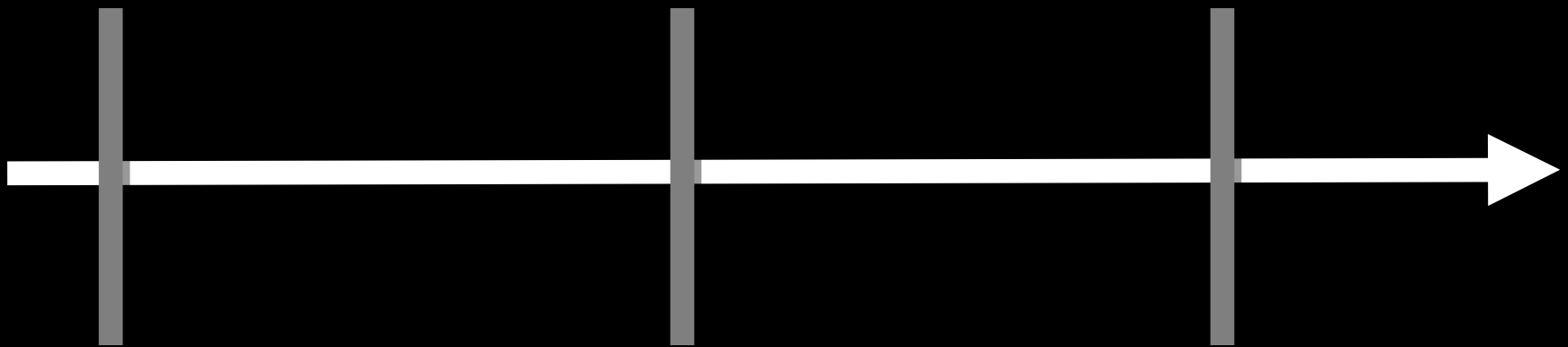
Extending conducted research by adding JAc and measurement of language production in the laboratory

Expected relations:

1. Responding to JA (gaze following) is related to language comprehension
2. Initiating JA, producing pointing are related to language production
3. Effectiveness of coordination of JAc is related to use of language

# Subject and methods

- subjects (N = 252; girls = 120)  
(M=52.3; SD=1.52; M=80; SD=1.79; M=104.3; SD=1.75)
- measurement



T1 (12 mths)

ESCS,  
pointing

T2 (18 mths)

pointing,  
joint action

T3 (24 mths)

lang. (comprehension  
and production)

# 1. Responding to JA and language comprehension - **methods**

12 mths

## Early Social Communication

Scales (Mundy et al., 2003):

- Initiating JA (IJA)
- **Responding to JA (gaze following) (RJA)**
- Behavioral Requests (BR)
- **Responding to Behavioral Requests (RBR)**

24 mths

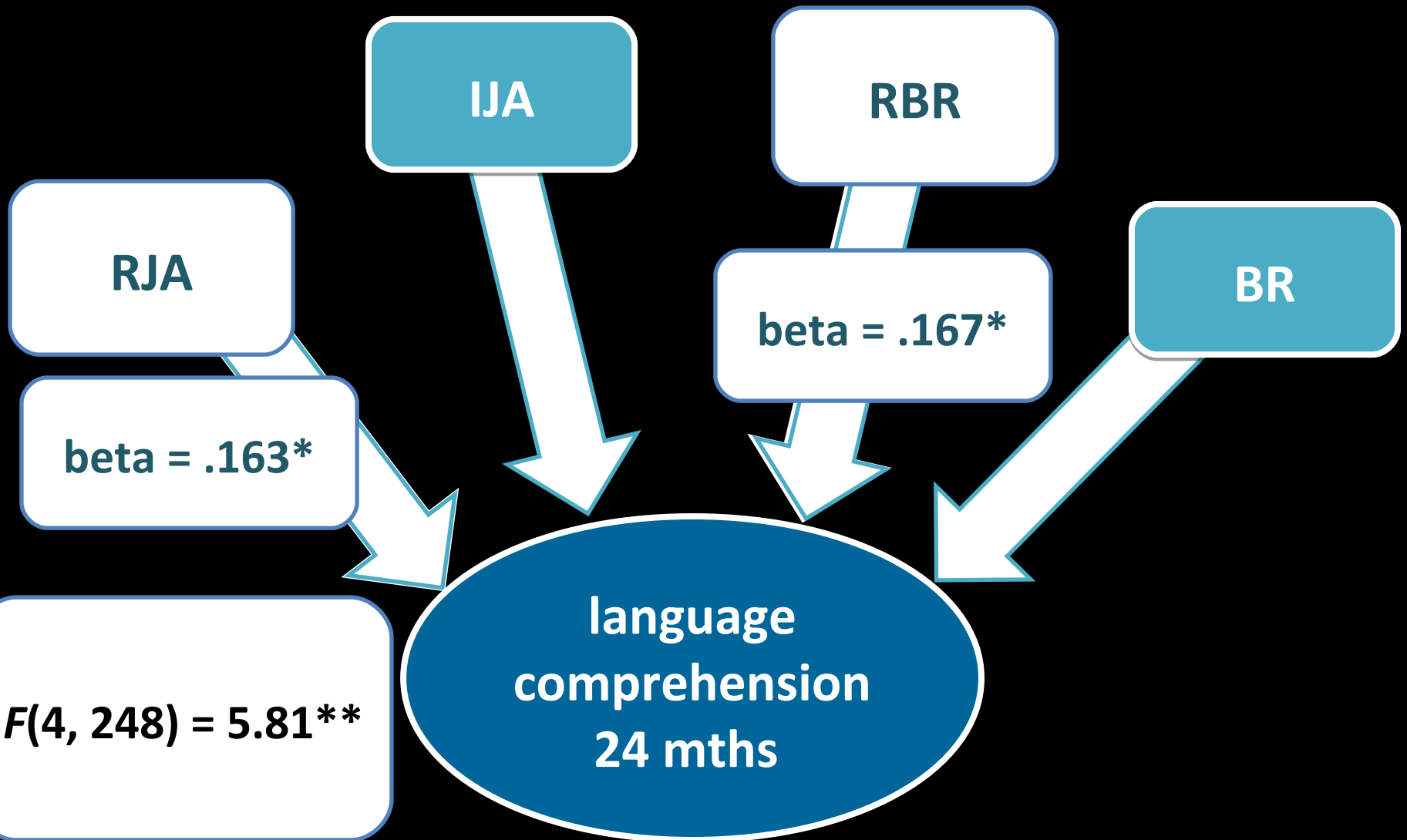
## Comprehension – Picture

Vocabulary Test:

Comprehension (Haman & Fronczyk, 2012)

- measures comprehension of words (pronouns, verbs and adjectives scales; total result)

# 1. Predictors of language comprehension - results





## 2. Initiating JA, pointing and language production - methods

12 mths

ESCS:

- Protodeclarative pointing (DP)
- **Initiating JA (IJA)**
- Responding to JA (gaze following) (RJA)
- **Behavioral Requests (BR)**
- Responding to Behavioral Requests (RBR)

## 2. Initiating JA, **pointing** and language production – **methods**

18 mths

- Protoinformative pointing (IP)  
two toys (horse and sheep) and illustration depicting them
- E presents the third toy (cow) – lack of illustration

Test – illustrations appear (two phases):

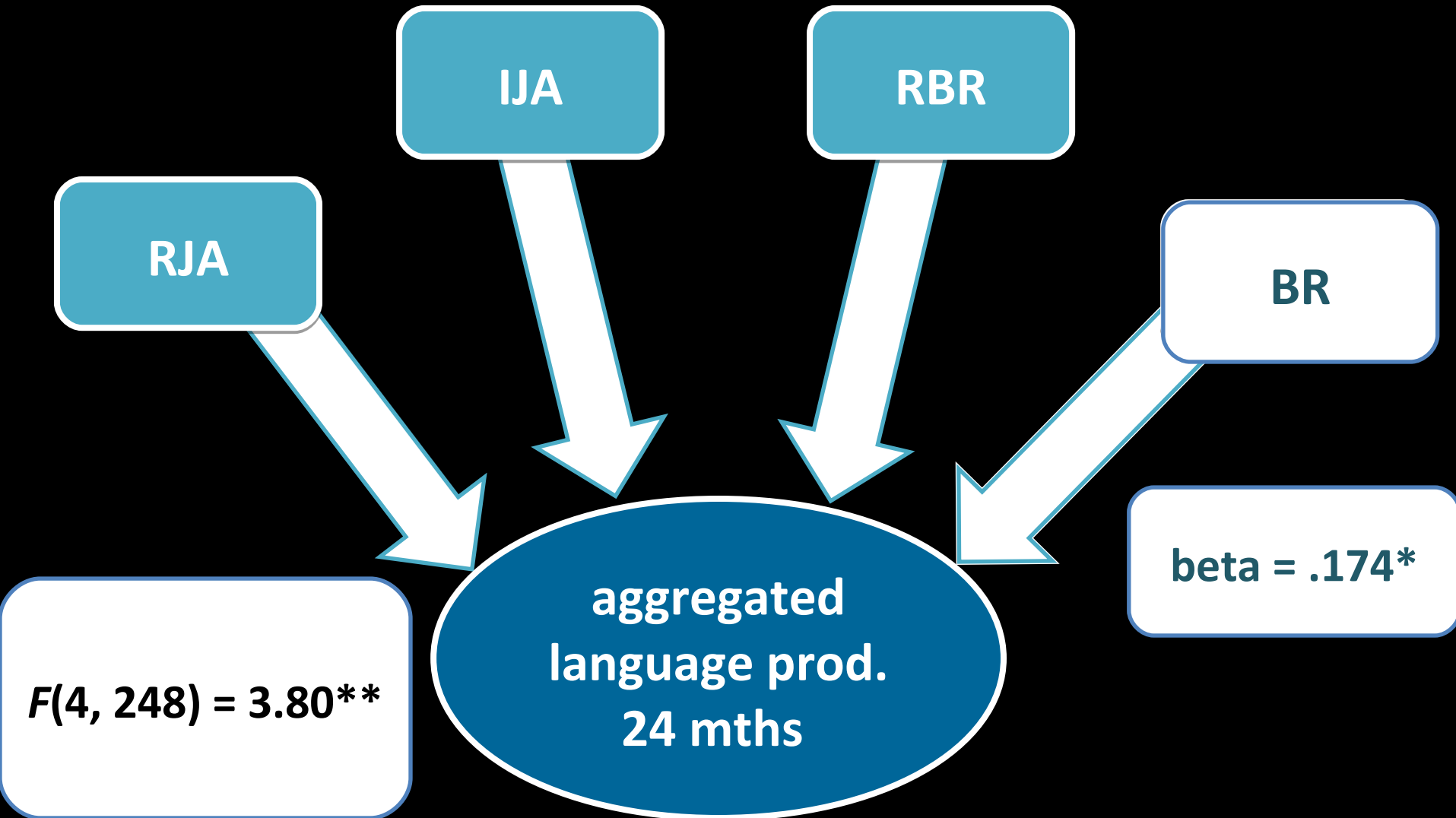
1. E doesn't see illustration > measurement of informing (IP I)
2. E sees wrong illustration > measurement of correcting (IP II)

## 2. Initiating JA, pointing and **language production** – methods

Language production – spontaneous expression of child during tasks in the laboratory

- Expressions classified into categories: word, two words, sentence, question
- **+ aggregated result**

## 2. Predictors of language production – results



## 2. Protodeclarative pointing (PD) and language - results

\*  $p < .05$ ; \*\*  $p < .01$

12 mths

production (24 mths)

words ( $p = .054$ )  
questions \*\*  
aggregated \*

~~comprehension~~

18 mths

words \*  
~~aggregated~~

# 2. Protoinformative pointing (IP) and language - results

\*  $p < .05$ ; \*\*  $p < .01$

18 mths



informing  
(E doesn't see)

IP I



correcting  
(E sees wrong)

IP II

production (24 mths)

words ( $p = .066$ )  
sentences \*  
aggregated ( $p = .061$ )

comprehension sum \*

words \*  
questions \*  
aggregated \*

comprehension sum \*

### 3. Coordination of joint action (JAc) and language – methods

pretending game – drinking tea

E picks up her cup and **without saying anything** stops her hand midway waiting for the child's reaction

we code the child's accurate coordination and **completion** of E's action

# 3. Joint action and language - results

18 mths

\*  $p < .05$ ; \*\*  $p < .01$

production 24 (mths)

non-verbal  
coordination

words \*\*  
sentences \*  
aggregated \*\*

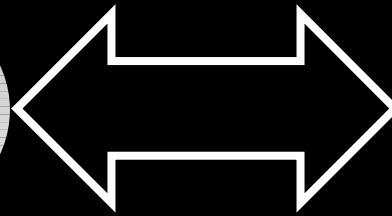
~~verbal  
coordination~~

~~comprehension~~



# Language production and language comprehension – results

language  
production



language  
comprehension

$$r_s = .292^{**}$$

# To sum up - language production

12 mths

18 mths

DP

JAc

BR

DP

JAc

Development of language production is more related to pointing/request production than to gaze/point/request following

DP

IP II

JAc

# To sum up – language comprehension

12 mths

18 mths

Development of language comprehension is more related to gaze/point/request following and pointing, which require comprehension of the situation, than to pointing to share interest

# To interpret

- production of pointing, joint action and language as progressively more advanced manifestations of motivation to **share, inform** (à la Tomasello)
- gaze-following, comprehension of situation and language as progressively more advanced manifestations of **alignment** of attention, situational requirements and minds
- developmental continuity in distancing:  
**in production:** pointing < JAc < speech  
**in comprehension:** gaze-following < comprehension of situation < comprehension of language  
BUT weak relation between production and comprehension

# Methodological challenges

Limitations: selective registration of early communication

Need for more detailed registration of development of children's communication ("distancing")

## 1. **Multimodal approach**

- **different forms of expression are produced under guidance of a single aim** (Kendon, 2004)
- micro-analyses of face-to-face interaction and communication: **analysis of gaze, facial expression, full body movement, vocalizations, gestures and speech**

## 2. **Ethological approach** (Blurton Jones, 1972)

- importance of starting with a thorough descriptive study
- **derive all psychologically meaningful variables from observational data**
- inductive approach

# Methodological challenges

- thorough description of behaviour (taking advantage of motion capture, audio recording and eyetracking technology) and identification of regularities

Are these processes precursors of language development?

- **contingencies** (Jaffe et al., 2001) in infant's and caregiver's diadic actions and expressions
- early manifestations of:
  - **bidirectionality** (lack of reciprocity in chimpanzees [Matsuzawa, 2010])
  - **alignment of attentions**
  - **complementary** actions in joint action

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

## Early Child Development Psychology Laboratory

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