

The development of verb meaning in first and second language acquisition: Talking and gesturing about placement



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Max-Planck-Gesellschaft



The dynamics of multilingual processing

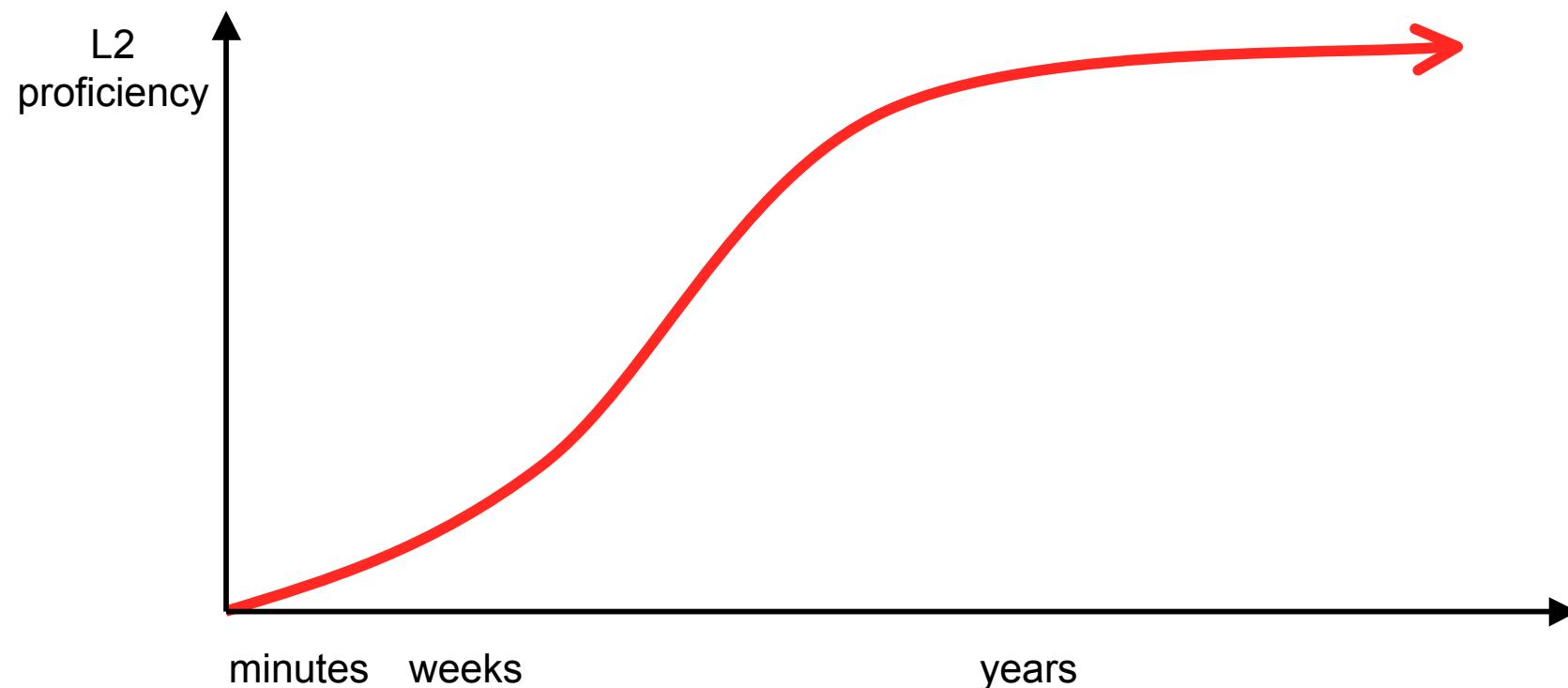
MPI for Psycholinguistics & FDCD for Cognitive Neuroscience
M. Gullberg & P. Indefrey
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The effects of exposure to an unknown L2

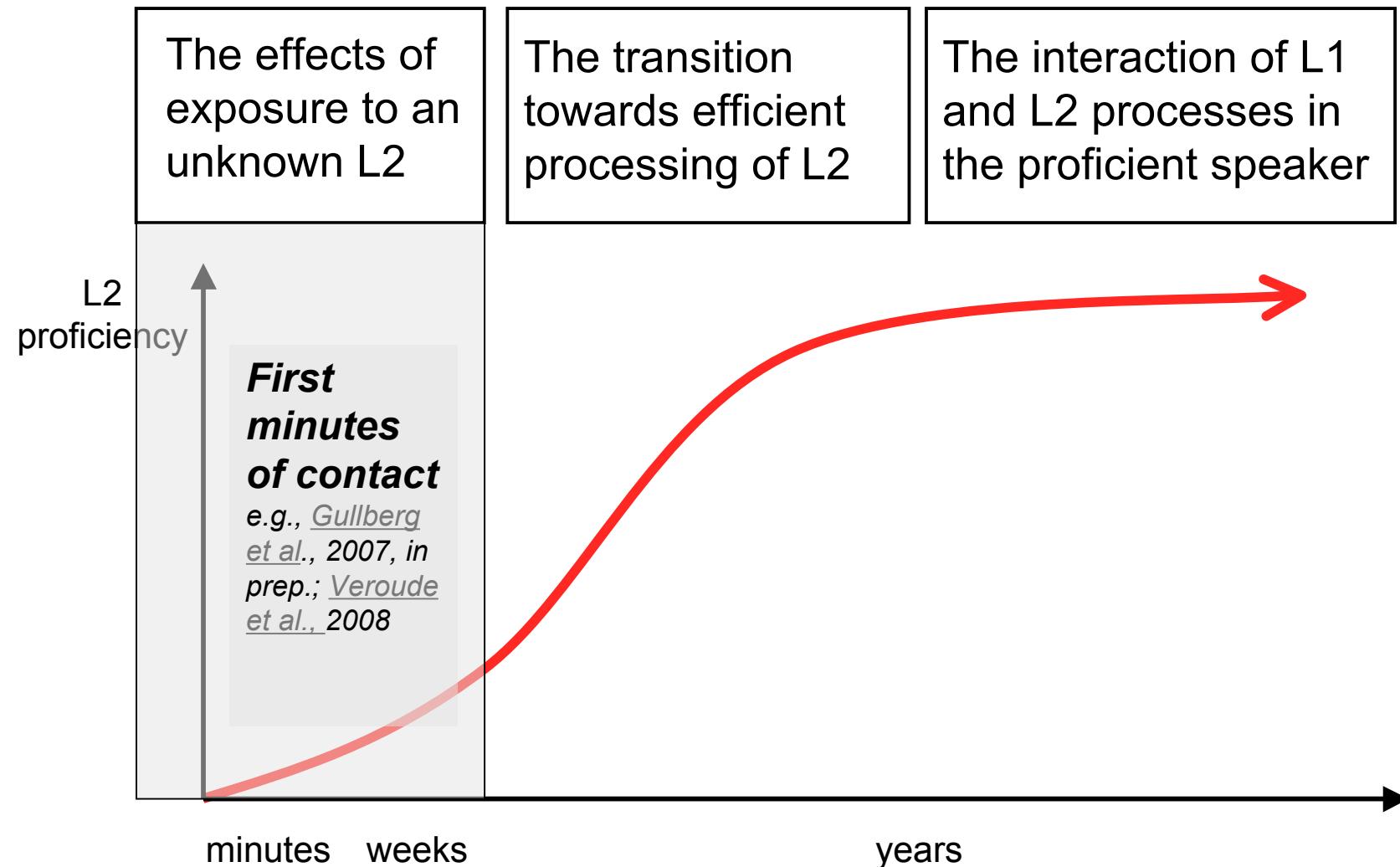
The transition towards efficient processing of L2

The interaction of L1 and L2 processes in the proficient speaker



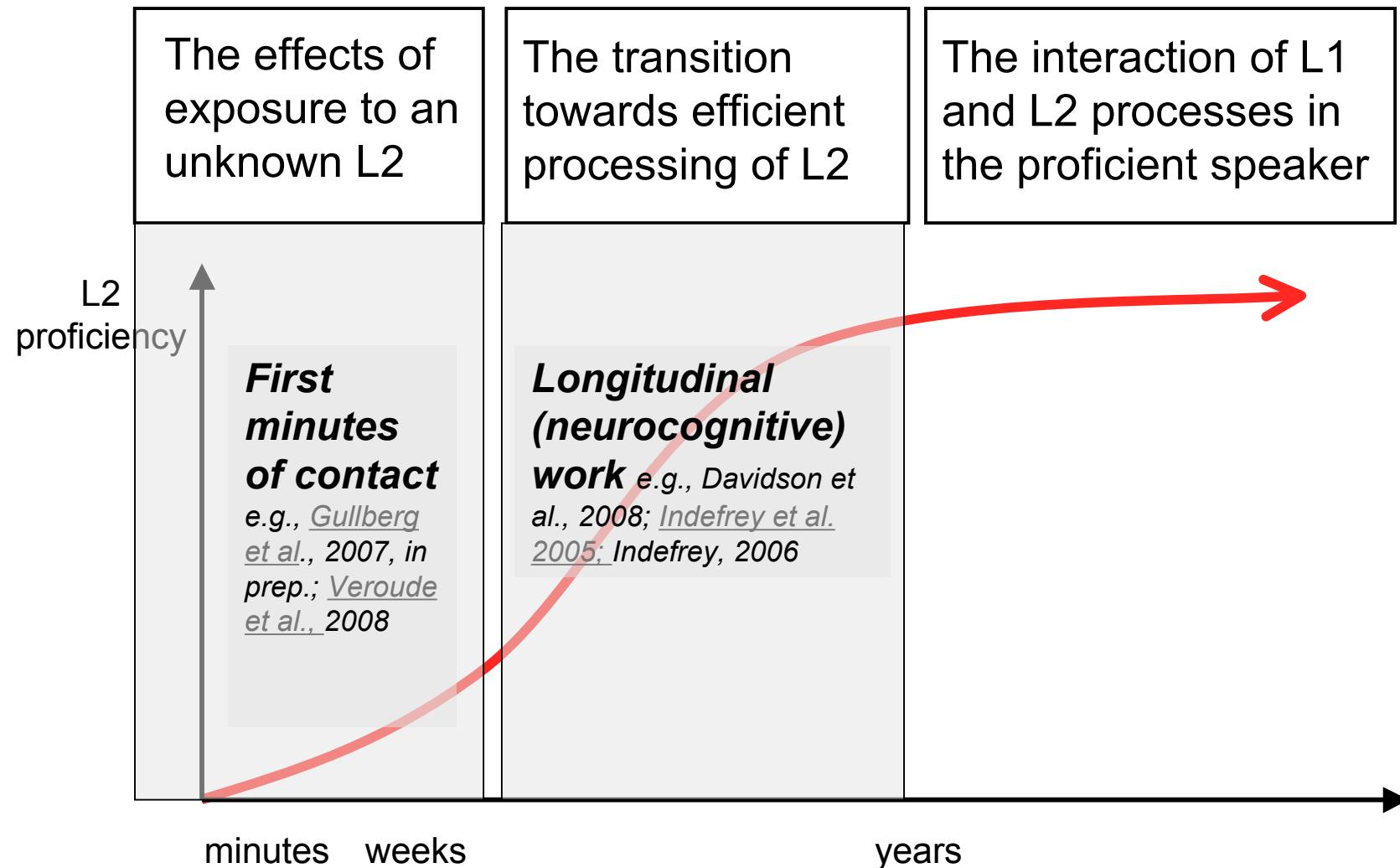
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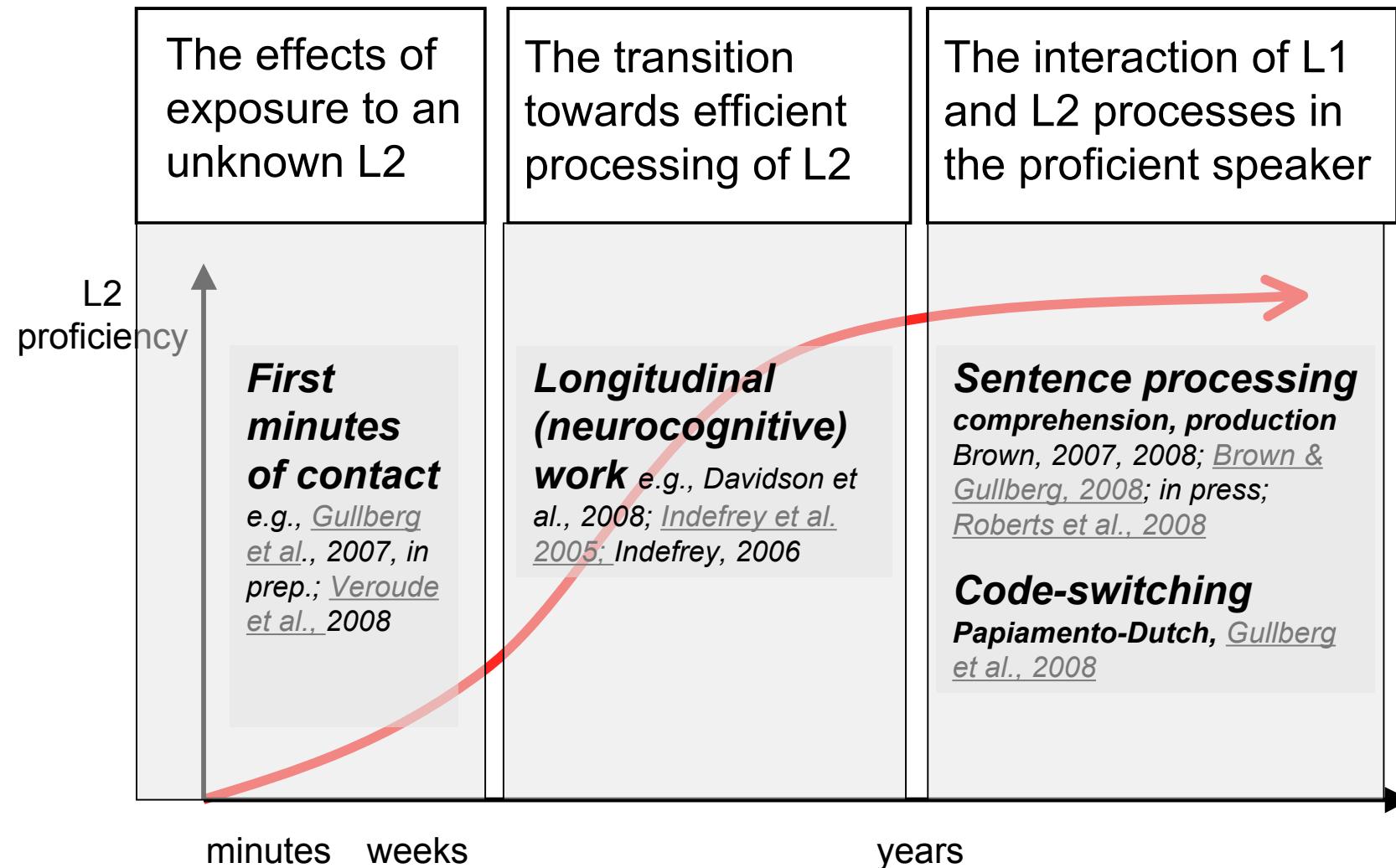
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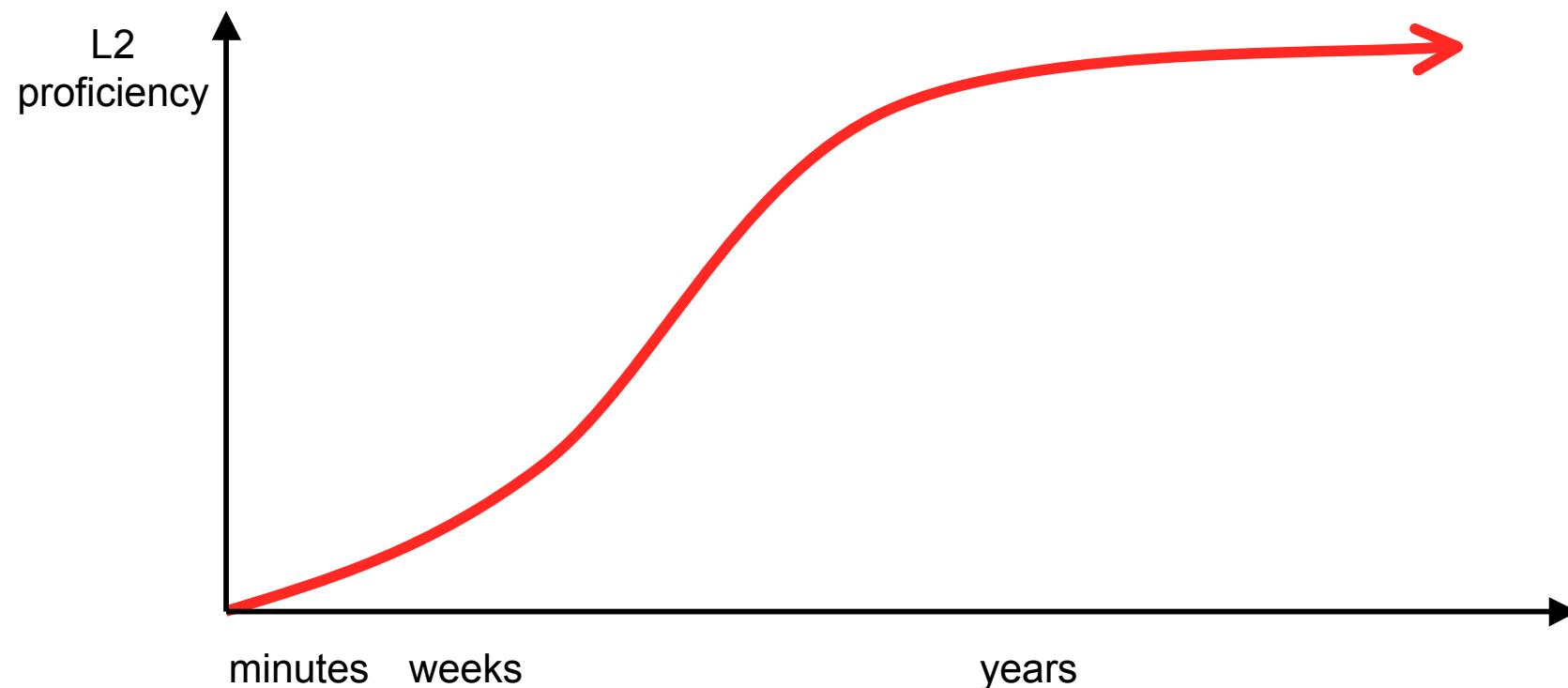
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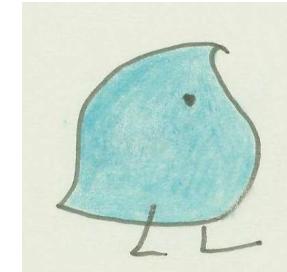
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The acquisition of meaning – key questions

children

- from where?
 - innate (nativism)
 - gradually developing (emergentism)



- uniform development?
 - things > relations (events)?
 - semantically general > specific?



(e.g. Choi & Bowerman, 1991; Choi & Gopnik, 1995; Clark, 1997; Gentner, 1992; Gleitman et al., 2005; Pinker, 1994; Theakston et al., 2002; 2004)

adults



ceiling



roof

tak

- the role of the L1?

- new forms on old meanings?
- re-organisation?

(e.g. Coppieters, 1987; Ervin, 1961; Graham & Belknap, 1986; Ijaz, 1986; Jiang, 2002; R. Ellis, 1994; Kroll & Stewart, 1994; Schwartz & Sprouse, 1996)

What learners mean – the development of semantic representations

'correct' form = 'correct' meaning?

production and comprehension 'errors' -> **no**

learners' meanings are different, **but how?**

if forms are targetlike, **how explore?**

gestures
“visible action as utterance”



Kendon 1986; 2004;



McNeill 1992; 2005

Gestures 1

vehicles of (linguistic) meaning

speech and gesture an audiovisual ensemble

parallel development, break-down, processing

semantic-pragmatic, temporal coordination

the 'same' meaning at the same time

what is focused and new

Feyereisen, 1999; Kendon, 1986; 2004; Levy & McNeill, 1992; Mayberry et al., 1998; McNeill, 1985; 1992; 2005; Seyfeddinipur, 2006; Volterra et al., 2004, Wu & Coulson, 2005, *inter al.*

the co-ordination



en daar heeft ze die pingpong bal **ingedrukt**
*and there has she the pingpong ball **inpushed***

speech-gesture an 'integrated' mode of expression

the nature and locus of the integration theoretically disputed
same conceptual origin (McNeill, 1985; 1992; 2005)
interface language and image (Kita & Özyürek, 2003; Kita et al., 2007)
communicative intention (Kendon, 1994; 2004; De Ruiter, 2000)

Gestures 2

vehicles of **language-specific** meaning

speech and gesture express the same information,
and spoken languages express different information

->> cross-linguistic differences in gestures

L_x meaning ≠ L_y meaning
L_x speech + gesture ≠ L_y speech + gesture

e.g., Brown & Gullberg, 2008; Choi & Lantolf, 2008; Duncan, 1996; 2002; 2005; Gullberg et al., 2008; Kita & Özyürek 2003; Kita et al., 2007; McNeill & Duncan, 2000...

form (what?)

timing relative to speech (when?)

distribution of info across modalities (what where?)

-> new possibilities to study how meaning develops

This talk

(adult, native) language users' gestures influenced by
their understanding of verb meaning

-> **crosslinguistic differences**

children's development of meaning

adult L2 learners' development of meaning

English
French

Placement *to put something somewhere*

Dutch

leggen
'lay'

put
mettre



zetten
'set/stand'



Bowerman et al., 2004; Hickmann, 2006; Lemmens, 2006, van Staden et al., 2006, *inter al.*

Why placement?

cognitively basic and universal category?

(Clark, 1996; Goldberg, 1995; Pinker, 1989)

-> but children mistakes, so not so basic (Bowerman, 1978)

-> but crosslinguistic variation, so not so universal

(Bowerman, Gullberg, Majid & Narasimhan, 2004; Majid, Kopecka, Gullberg, Bowerman, & Narasimhan, to appear; Kopecka & Narasimhan, to appear)

- language-neutral representation based on

practical action? (cf., Glenberg & Kaschak, 2002; Pulvermüller, 2005; Tettamanti et al., 2005; Zwaan, in press)

1. Language-specific meaning in placement gestures?

language-**neutral** representations (enacted practical action)?

Dutch = French = action

language-**specific** representation in speech and gesture?

Dutch \neq French

Verbs	Gestures
Dutch <i>zetten/leggen</i> Movement + Object	Hand shape
French <i>mettre</i> Movement	No hand shapes

An event description task

Director-Matcher game

- **Describer** - watch 1 clip (= 4 objects),
describe from memory
(word list support) - *What did the woman do?*
- Drawer - picture of empty room
draw the objects
- Participants
 - 12 native pairs of Dutch
 - 12 native pairs of French



Speech

First spontaneous description of the target event

- D de prullenbak is omgevallen die zet ze rechtop naast het bureau
the wastepaper basket has fallen over this she sets straight next to the desk

- F elle prend la poubelle elle la met à droite du bureau
she takes the wastepaper basket she puts it to the right of the desk

Same structure, to isolate verb meaning

Gestures

Gesture strokes co-occurring with first descriptions

- **Form** - sound off (interrater .92)
 - Object info —> handshape
 - Simple path —> spatial excursion, pointing or lax hand
- **Timing** - sound on (interrater .96)
 - Alignment with speech: V, Obj, Loc Phrase, Other

The move_bowl_desk_event





Dutch



zet ze dat kommetje rechts achter op haar bureau
'sets she the bowl to the right back on her desk'

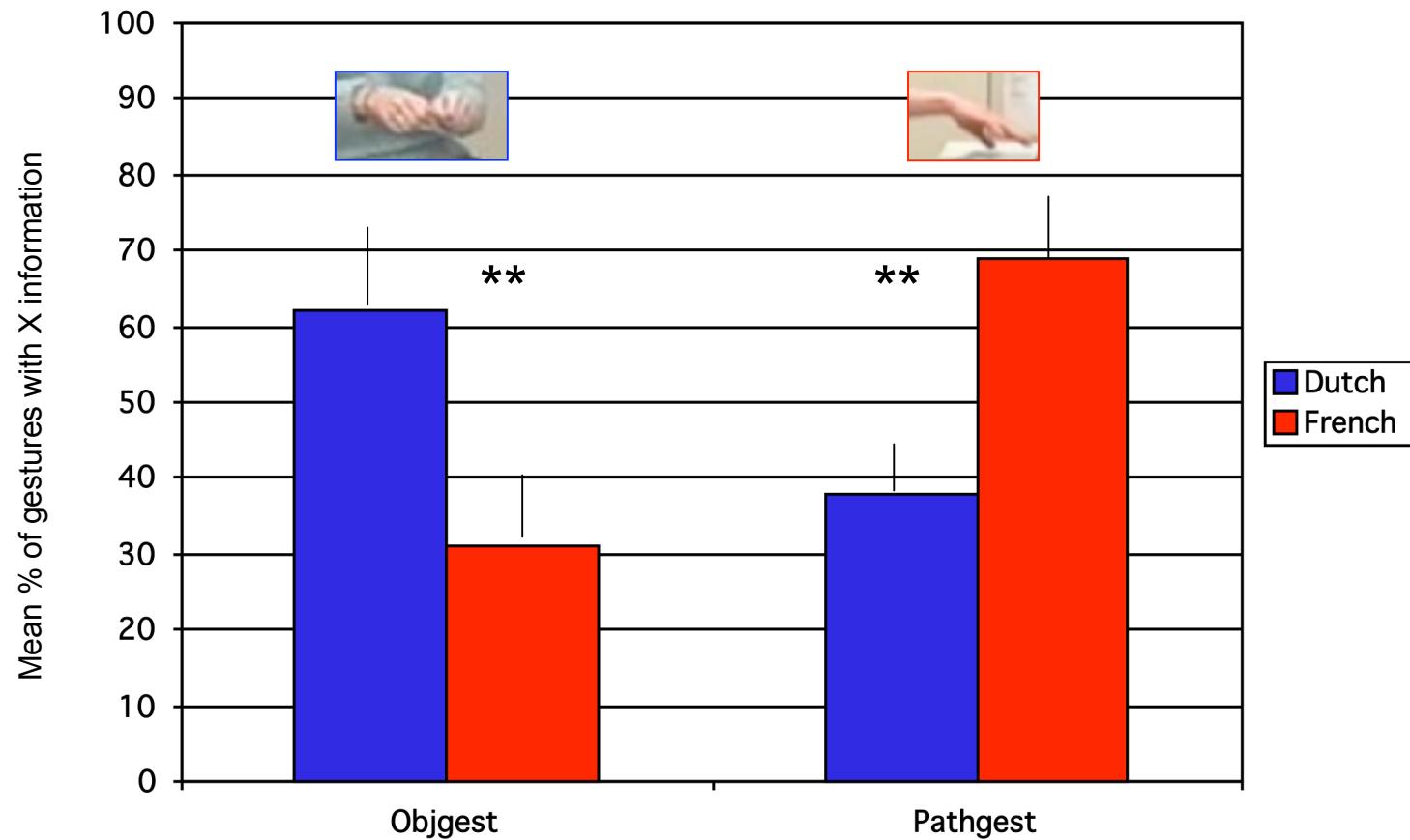


French



elle met elle **met** le tout sur le dans le coin [...]
'she puts she **puts** all in the corner [...]'

Dutch vs. French robust preferences



Dutch



French



*object and path
move-object*

*path
move*

YES, language-specific meaning in placement gestures in adult native speakers

Dutch ≠ French

posture verbs

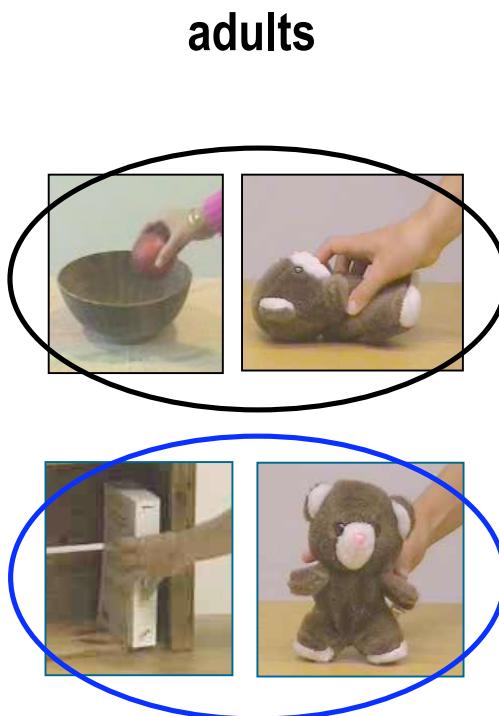
general placement verb

move obj

move

- > placement gestures ≠ enacted action
 - > *mettre* ≠ *zetten* + *leggen*
 - > gesture = speech
- possibilities for acquisition

2. Learning the meaning of placement verbs - what Dutch **children** mean



input frequencies

to adults	to children (CHILDES)
48%	32%

leggen 'lay'

50% 68%

zetten 'set/stand'

Obligatory and frequent -> easy?

Event description – the child task

- Stimuli
 - 16 **core** events - 8 objects horizontal or vertical
 - 20 additional **filler** events (+ 3 warm-ups)
- Participants
 - 12 children (3;1-6;0) median 4;5
 - 10 adults
- Coding identical
interrater gesture
.94, .92



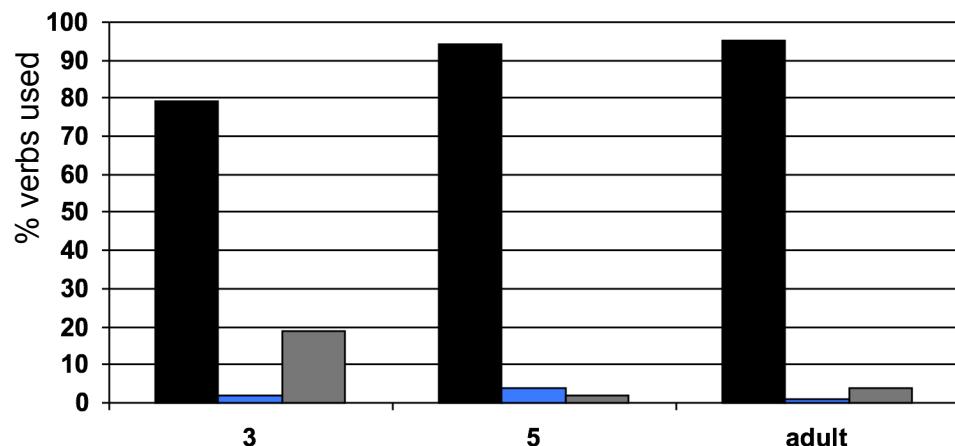
Speech - verb meanings (extensions)



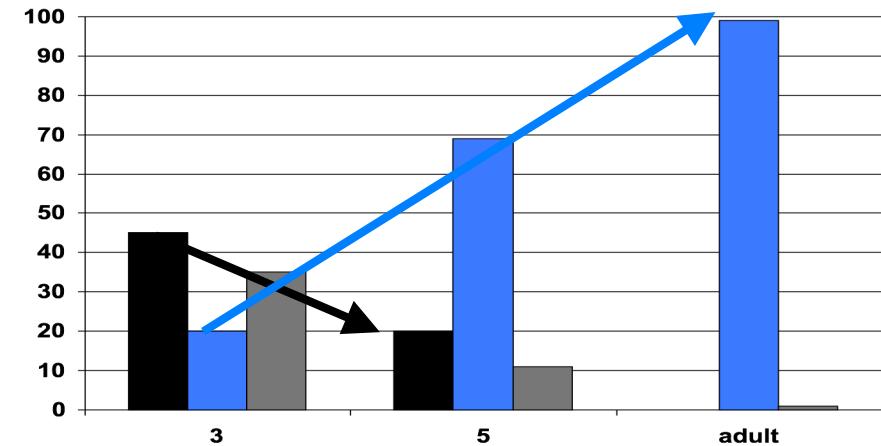
horizontal – *leggen* ‘lay’



vertical – *zetten* ‘set/stand’

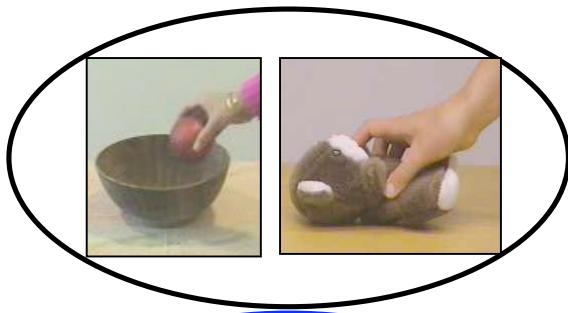


- *leggen* ‘lay’
- *zetten* ‘set/stand’
- other

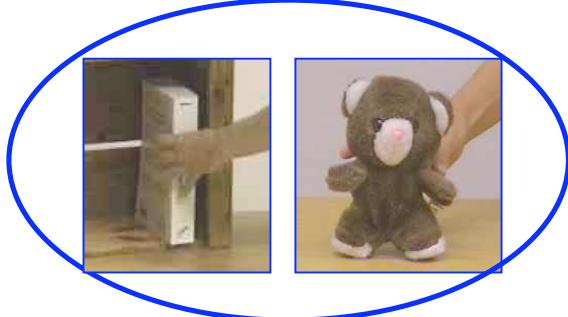


placement verb meanings are difficult:
over- and under-extension at 3 and 5

adults



leggen 'lay'



zetten 'set/stand'

children



What do children who only say *leggen* mean?



adults horizontal ->> obj+path



eh de persoon **legt** een witte cirkel in de uitsparing
*'uh the person **lays** a white circle in the cut-out'*



Adults vertical ->> obj + path



nee nee, ze hield het vast en **zette** het toen op de tafel neer
'no, no, she held it fast and **set** it then on the table down'



vertical ->> **path** (3;5)



op**leggen**
'**onlay**'



horizontal ->> path (5;4)



ze **legde** iets neer
she **laid** something down'



horizontal ->> obj + path (6;0)



een v.. een hand die **legde** een beertje op de tafel
*'a w a hand that **laid** a teddybear on the table*

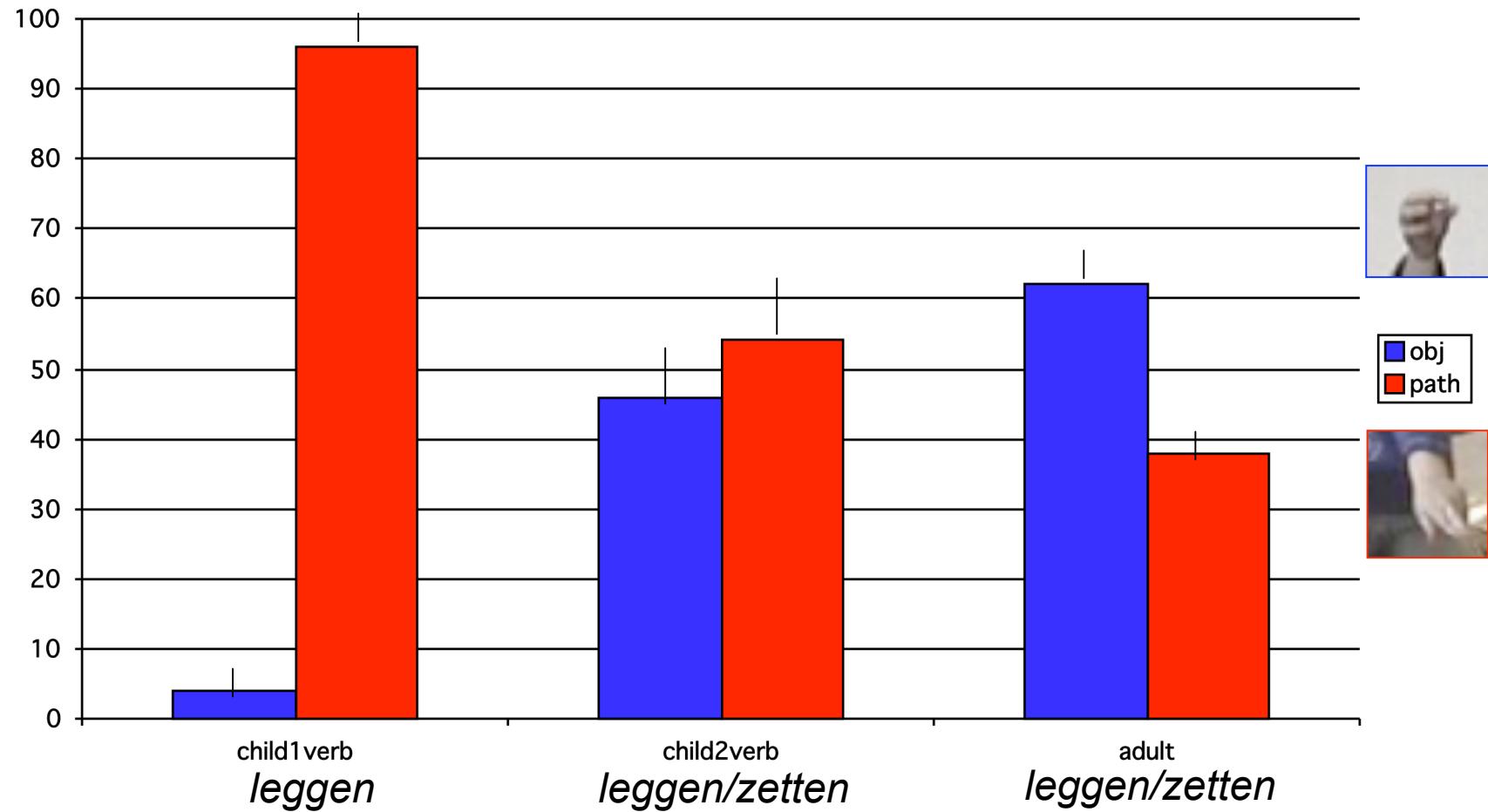


vertical ->> obj + path (6;0)



een hand **zette** een poppetje op tafel
*'a hand **set** a doll on table'*

Is there a link gesture-speech? one verb vs. two





vertical ->> intransitive *staan* **path + leggen** (4;5)



nou die staat [...] hij legt 'm op de tafel
'well it stands [...] he lays him on the table'

leggen



1 semantic component

path gestures
'move'

leggen zetten



2 semantic components



obj + path gestures
'move-object'

What gestures reveal about semantic development in children

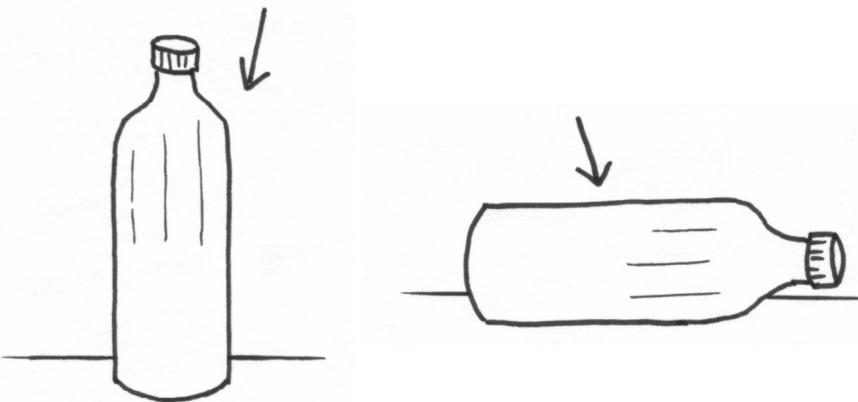
Dutch children's gestures differ depending on what they know about verb meanings

- targetlike form in speech ≠ targetlike semantics
- more info about semantic representations and adjustments (**addition** of obj component)
- parallel change in speech and gesture

3. Learning the meaning of placement verbs - what **adult** Dutch speakers mean in French

new (L2) form onto old (L1) meaning? (e.g., Jiang, 2000)

but adjustment also necessary



ze **zet** de fles op tafel
she sets the bottle on table

ze **legt** de fles op tafel
she lays the bottle on table

on top of
DIF~~A~~CULT

elle **met** la bouteille sur la table
she puts the bottle on the table

What do adult learners mean by *mettre*?

- 12 Dutch advanced foreign language learners of French
(cf. Bartning & Schlyter, 2004)
 - 9 - 11 ys of study of French as foreign language
 - max 3 weeks stay in France
- Procedures, data treatment identical
 - Describers = learners
 - Matchers = native speakers Fr
 - interrater gestures .86, .92

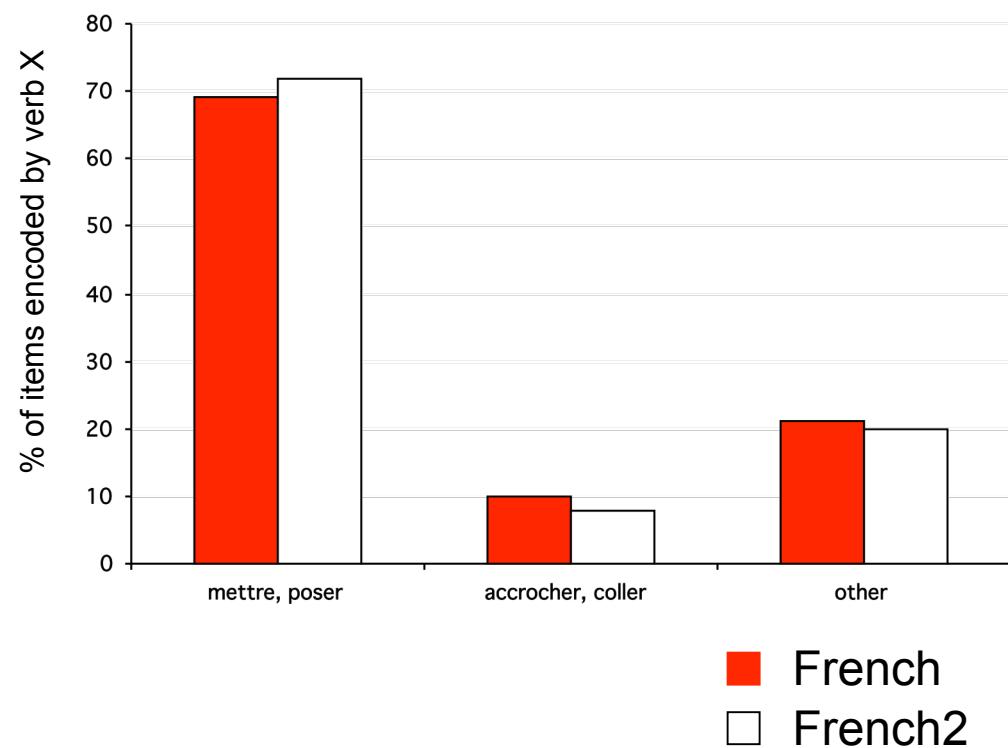
Target-like L2 speech French vs. French2

French: elle prend la poubelle elle la met à droite du bureau
she takes the wastepaper basket she puts it to the right of the desk

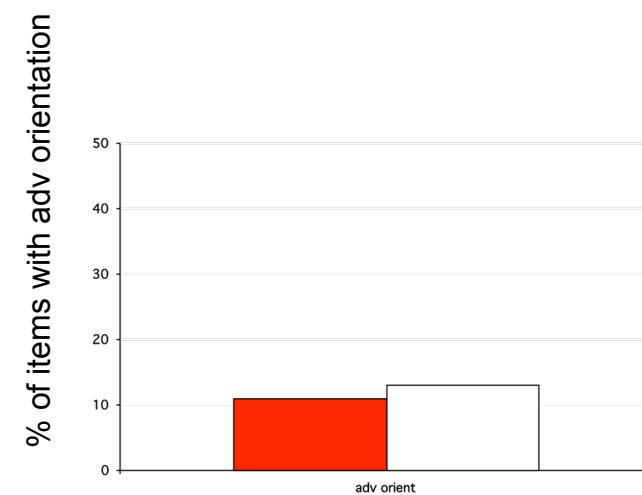
French2: cette fille d'abord prend la poubelle et le met à droite du bureau
this girl first takes the wastepaper basket and puts it to the right of the desk

French vs. French2 speech (aggregated)

Same verbs and as often



No extra distinctions in Adv





Dutch1 French2



donc elle a placé le bol uh en face
'so she *placed* the bowl uh in front'

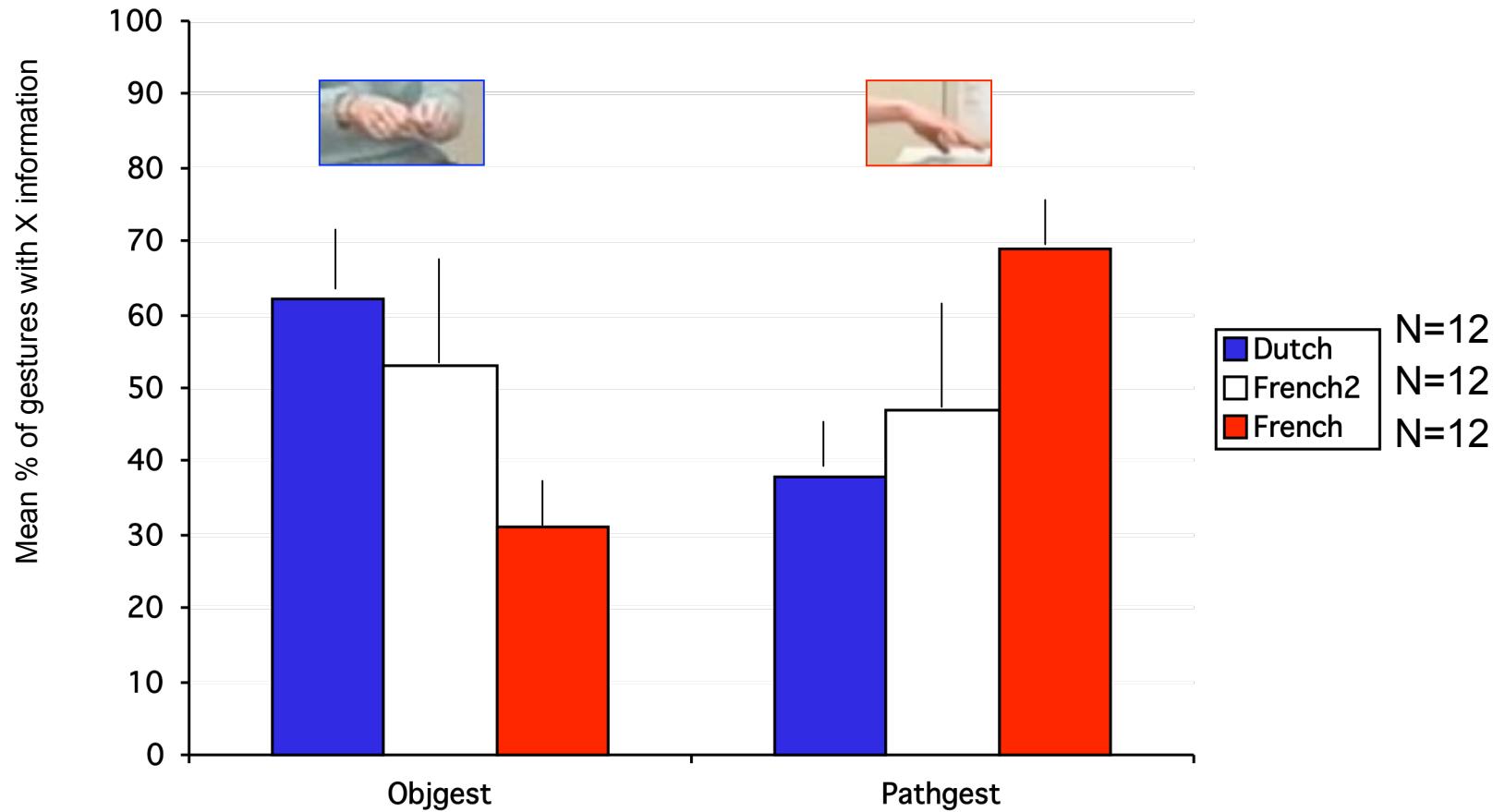


Dutch1 French2

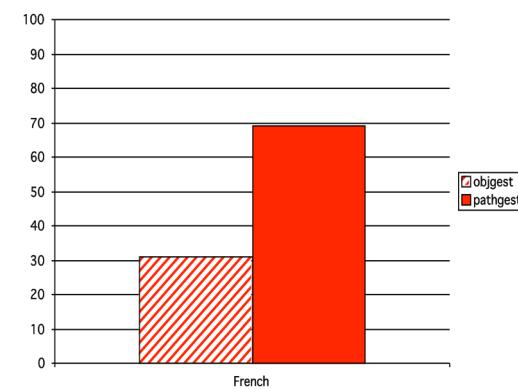
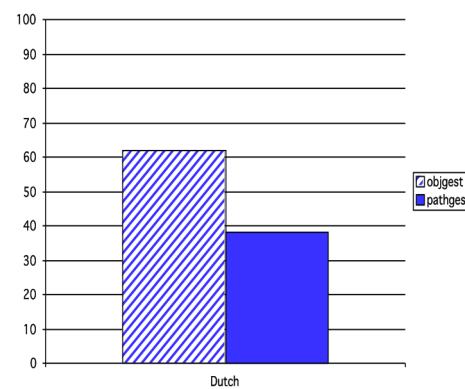
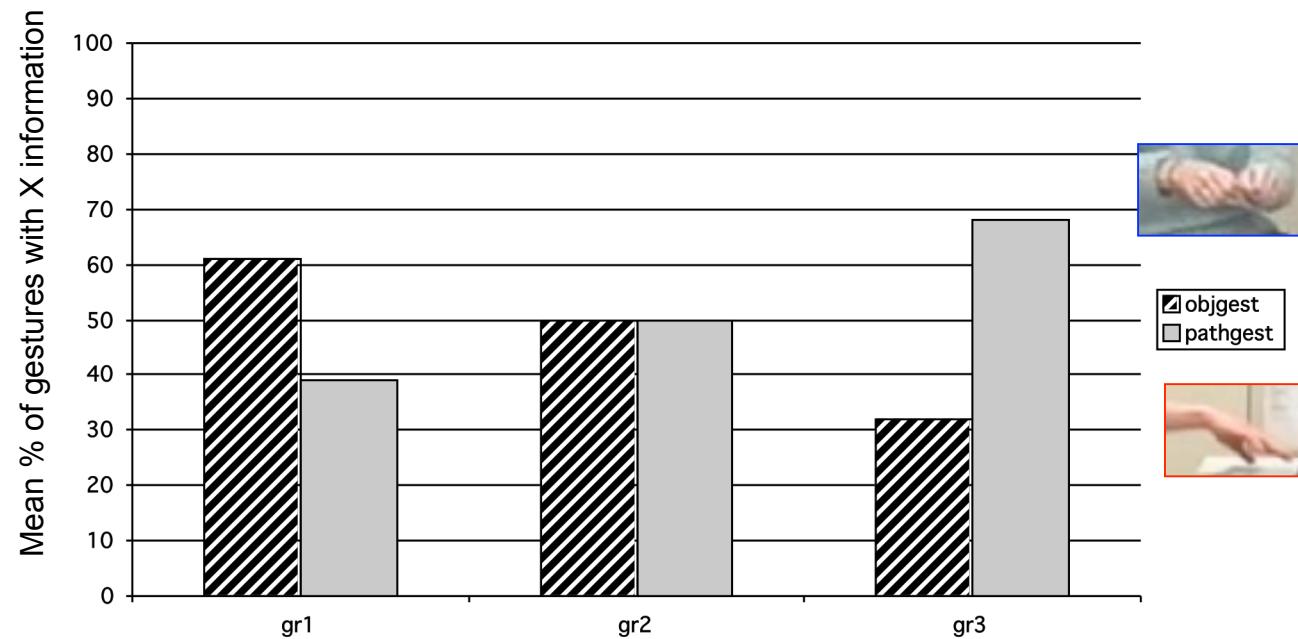


et elle **met** le bol au coin arrière droite
'and she **puts** the bowl in the corner at the back to the right'

Dutch vs. French2 vs. French



French2 groups

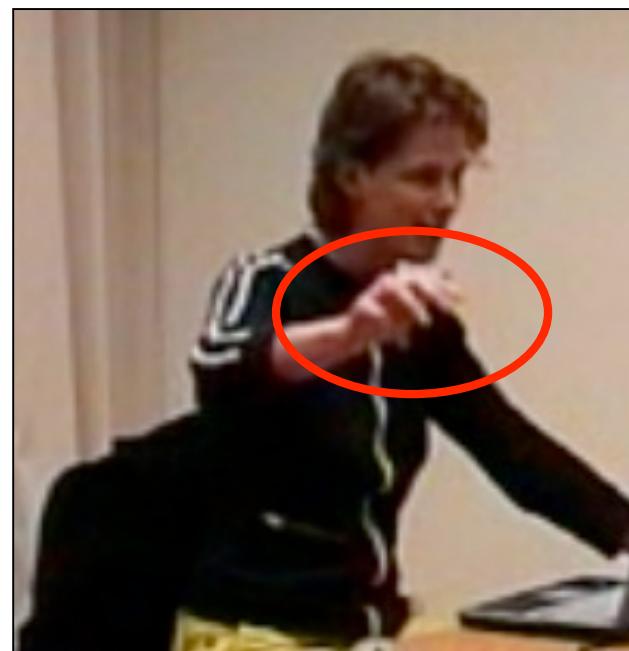




2 semantic components
obj + path gestures
'move-object'

-> L1 influence(?)

cf. Gullberg, submitted (Dutch and German L1)



1 semantic component
path gestures
'move'

-> learning?

What gestures reveal about semantic development in adults

adult Dutch second language learners' gestures differ depending on what they know about verb meanings

- targetlike form in speech ≠ targetlike meaning
- more info about semantic representations and adjustments (**removal/change** of obj component)
- (bidirectional) transfer vs. general learner/bilingual phenomena (Brown & Gullberg, 2008, submitted a,b; Gullberg, submitted)

What gestures contribute to

acquisition studies

- shed light on the product and process of acquisition
 - details in semantic representations, event construals
 - shifts (of focus) in representations, construals
- broaden the view of acquisition
 - speech and gestures as ensemble move beyond error analysis

What developmental data contribute to gesture studies

Speech and gesture an 'integrated' system

- crosslinguistic differences
- parallel shifts across modalities in development

- little evidence that gestures mainly a compensatory support system in learning

(cf. Gullberg, 1998; Gullberg, et al., 2008; *pace* Goldin-Meadow, 2003)

- but decoupling possible – how far and still integrated?

What it means to

language and cognition

Focused information beyond speech

- *mettre* ≠ *zetten* + *legen*
- linguistic cognition (*thinking for speaking*) in action
linguistic categories influence how we segment reality to talk
and gesture about it
- because gestures are linked to language, they are not suitable
for exploring linguistic relativity (effects on general cognition)

Conclusions

gestures reflect speakers' (current understanding of) verb meanings

therefore shed light on acquisition of meaning in children and adults beyond error analysis, providing a window on details of representations

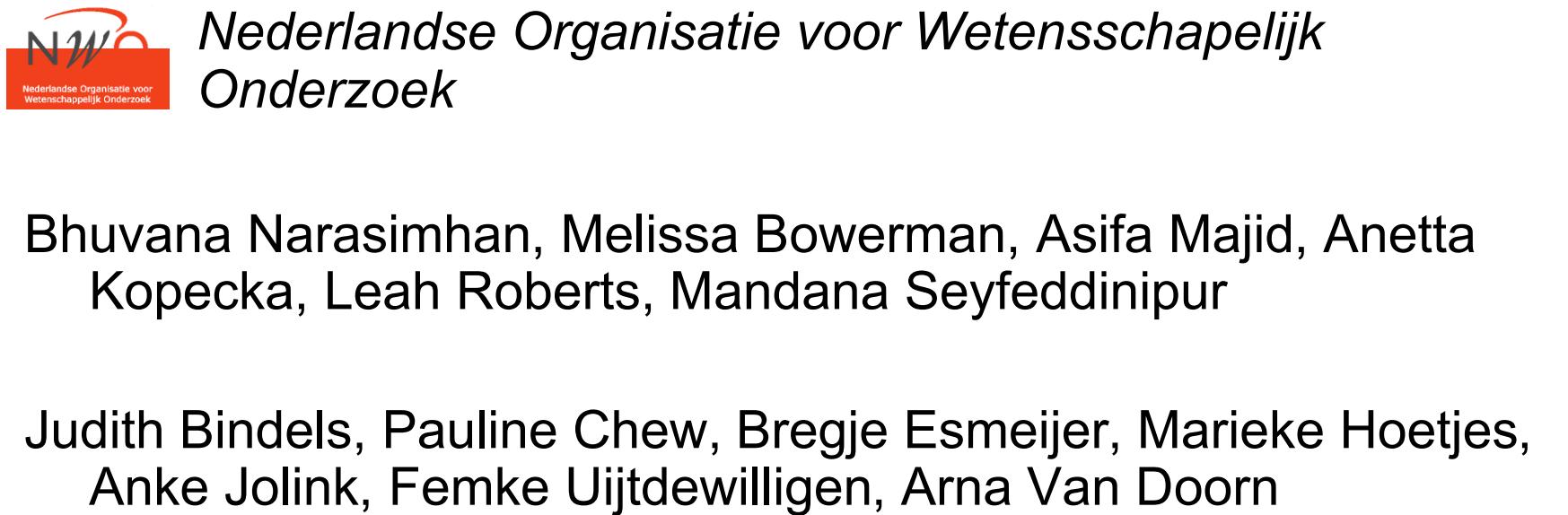
developmental data contribute to our understanding of the nature of speech-gesture integration

“[...] the Hand, that busie instrument, is most talkative [...] as if Man had another mouth or **fountaine of discourse** in his Hand.”



Bulwer, 1644, *Chirologia*

Thanks to



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The influence of the L2 or bidirectional influence?

Brown, 2007; Brown, 2008; Brown & Gullberg 2008; in press; submitted



English
speech: manner
gesture: path



Japanese
speech: manner
gesture: manner



English L2

Japanese L1

