6. Mimetic schemas and children's gestures

Lectures in Cognitive Semiotics

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Overview

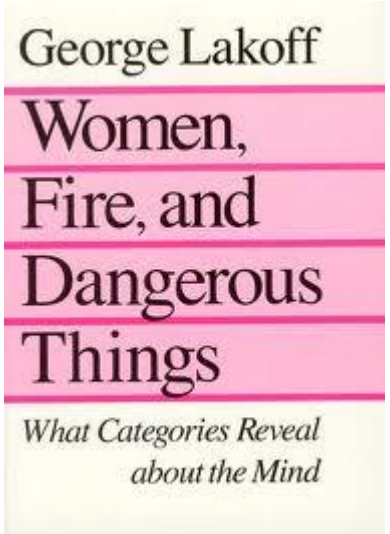
- Embodiment, image schemas and mimetic schemas
- The main hypothesis: ***children's (iconic) gestures emerge as overt mimetic schemas***
- An empirical study with 3 Thai and 3 Swedish children 18-26 months
  - Methodology
  - Predictions
  - Results
- Theoretical implications: ***mimetic schemas play an important, but not exclusive role in the development of bodily communication***

Image schemas

- Originally defined as "**a recurring dynamic pattern of our perceptual interactions and motor programs that gives rise to coherence and structure to or experience**" (Johnson 1987: xiv)
- Emerged in discussions of how linguistic meaning and abstract thought can possibly be "grounded" in perception and action; **"embodiment"**
- Prototypical, or at least frequently cited, image schemas are notions such as **PATH** and **CONTAINER.**

Embodiment and image schemas

- Lakoff & Johnson (1980) *Metaphors We Live By*
- Lakoff (1987) *Women, Fire and Dangerous Things*
- Johnson (1987) *The Body in the Mind*
- Lakoff & Johnson (1999) *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*



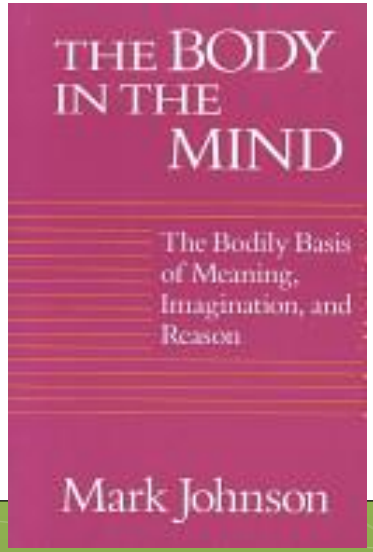


Image schemas

- Meanings of (spatial) adpositions?

"The English word "into" is understood via a superimposition of the Source-Path-Goal schema on the Container schema, as follows:

- "in" activates a Container Schema with the interior profiled.

- "to" activates a Source-Path-Goal schema with the destination (endpoint) profiled.

The destination (endpoint) is mapped onto the interior of the container schema…"
(Johnson & Rohrer 2007)

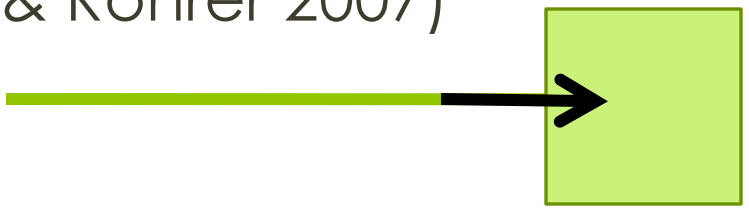


Image schemas: issues

1. **Conscious** or at least accessible to consciousness (Gibbs 2005; Langacker 2006) or **part of the "cognitive unconscious"** (Lakoff &Johnson 1999)?
2. **Representational** (Mandler 2005) or **non-representational, interactional structures** (Lakoff and Johnson 1999)?
3. Tied to **individual bodies and brains** (Dodge & Lakoff 2005) or **interpersonally shared** (Johnson 1987)?

Image schemas: issues

1. Based on **concrete bodily actions** (Johnson 1987), or on **basic process of consciousness** such as "perceptual meaning analysis" (Mandler 2005) or "mental scanning" (Langacker 2006)?
2. Essentially **identical with linguistic meanings**, especially closed-class morphemes such as spatial prepositions (Johnson and Rohrer 2007) or rather **pre-linguistic structures/processes that motivate, but do not determine linguistic meaning** (Zlatev 1997, 2011)?
3. **Universal** (as most often assumed) or to a large extent **culture-specific** (Kimmel 2005)?

Hampe, B. and Grady, J. 2005 (eds.), *From Perception to Meaning: Image Schemas in Cognitive Linguistics.* Berlin: Mouton de Gruyter

Mimetic schemas

- Inspired by **image schemas** in Cognitive Linguistics (Johnson 1987) – but a notion that is less ambiguous and more explicitly grounded in the living/lived body (Husserl, Merleau-Ponty)
- The key role of **bodily mimesis** in human evolution (Donald 1991) and child development (Nelson 1996)
- **The emergence of symbols**: from sensorimotor to representational imitation (Piaget 1962)
- **Emotional, value-laden meaning** (Stern 1998; Thompson 2007; Trevarthen 2012)

Mimetic schemas

- "dynamic, concrete and preverbal representations, involving the body image, accessible to consciousness and **pre-reflectively shared in a community**" (Zlatev 2005: 334)

- "fairly specific, cross-modal, consciously accessible representations based on imitation, and **largely shared within a (sub)culture**" (Zlatev 2007a: 131)

Features

- ***Bodily*** – involve proprioception and kinesthesia even if the action is imagined (covert) rather than reenacted (overt)
- ***Representational*** – "running" the schema (overtly or covertly) is differentiated from the activity or action to which is corresponds
- ***Fairly specific*** – each mimetic schema is a generalization of a specific bodily activity or action
- ***Pre-reflectively shared*** – derive from imitating culturally salient activities and actions
- ***Dynamic*** – involve motion in both "expression" and "content"
- ***Accessible to consciousness*** – even if marginal, rather than focal consciousness

La formation de symbol chez infant

- Piaget (1945 [1962]): "symbols" (≈ mimetic schemas) crucially involve ***imitation***, along the following epigenetic progression:
  1. ***sensorimotor imitation***: in which the model's action is imitated directly;
  2. ***deferred imitation***: in which the imitated action – either of another, or of oneself – is displaced in time;
  3. ***representational imitation:*** in which "the interior image precedes the exterior gesture, which is thus a copy of an 'internal model' that guarantees the connection between the real, but absent model, and the imitative reproduction of it. […] **Imitation, with the help of images, provides the essential system of 'signifiers' for the purpose of individual or egocentric representation"** (Piaget 1962: 279-280).

- **Egocentrism** = "failure to differentiate between the ego and the group, or confusion of the individual view-point and that of others" (1962: 290).

Mimetic schemas

- "categories of acts of **overt or covert [dyadic] bodily mimesis**" (Zlatev 2007b: 133), i.e. **pre-linguistic concepts**

	"intransitive"	**"transitive"**
Activities (UNBOUNDED)	JUMP, RUN, CRAWL, CRY, FLY, DANCE	EAT, DRIVE, RIDE
Actions (BOUNDED)	SIT DOWN, STAND UP	KICK, KISS, GRASP HAMMER, CUT

Bodily mimesis (Zlatev 2005, 2007, 2008a, 2008b)

An act of cognition or communication is an act of bodily mimesis if and only if:

1. It involves a ***cross-modal mapping*** between exteroception (e.g. vision) and proprioception (e.g. kinesthesia).
2. It is ***under conscious control*** and ***corresponds to*** some action, object or event.
3. The subject ***intends*** the act to stand for some action, object or event ***for an addressee,*** and for the addressee to recognize this intention.
4. It is ***not fully conventional*** (and normative).
5. It does ***not divide (semi)compositionally*** into meaningful sub-acts that ***systematically relate*** to other similar acts (as in grammar).

Semantic "grounding" (action) verbs

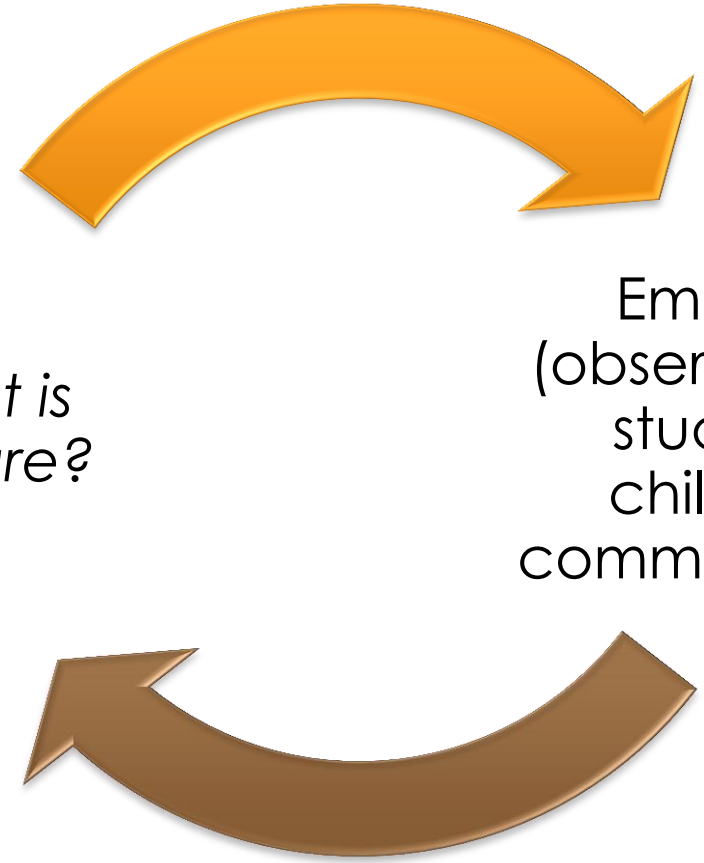
Classifying all **motion terms** (N = 84) of a single child emerging during **16-24 months**
(Zlatev 2005; based on Tomasello (1992: 187-221)

	Category	Examples	Number
Mimetic Schemas	Activities/actions with objects	sweep, cut, hammer, drive, kick…	48
Mimetic Schemas	Activities without objects	cry, pee-pee, jump, swim…	36
Image Schemas (?)	Change-of-state predicates, focus on motion	move, stay, stuck, go, come, put, get-out, bring, take	9
Image Schemas (?)	Change-of-state predicates, focus on goal	up, down, on, off, in, out, over, under, here, there	8

Mimetic schemas in the "grounding" of gestures?

"…mimetic schemas underlie both speech and gesture, thereby accounting for the close synchronization of the two modes of expression" (Zlatev 2005: 335)

A cognitive-semiotic approach to the ontogeny of gesture (Andrén 2010)



Andrén (2010), Zlatev (in press)

"Gesture": CI-3 or/and SC-3

Level	Communicative intent (CI)
CI-3	Explicitly other-oriented action (Clear communicative intentionality)
CI-2	Action framed by mutual attunement (Unclear communicative intentionality)
CI-1	Side effect of co-presence (No visible communicative intentionality)

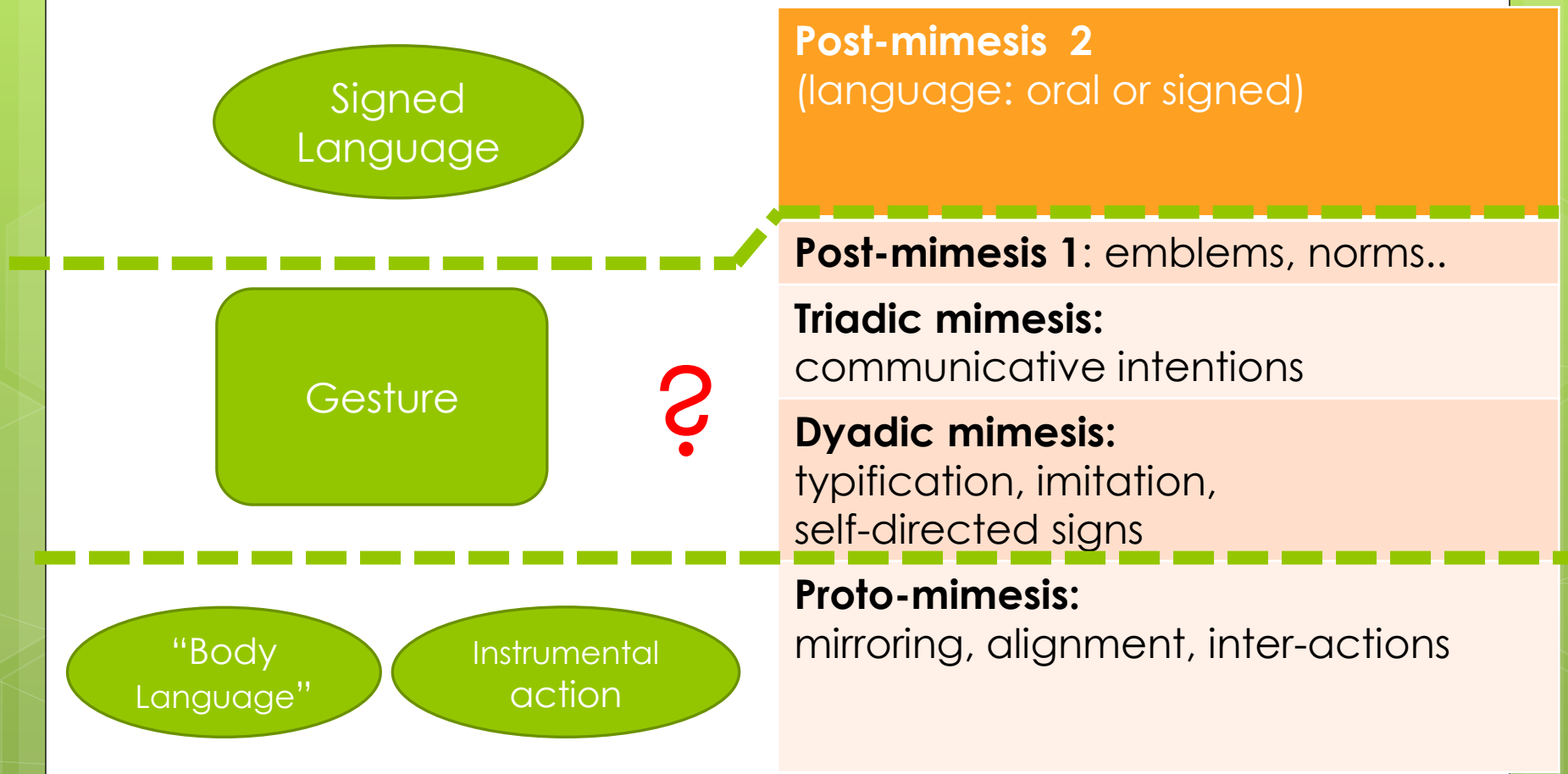
Level	Semiotic Complexity (SC)
SC-3	Explicit signs: Expression E **stands for** meaning M
SC-2	Typified acts: Expression E **counts as** doing action A
SC-1	Situation-specific acts: Expression E…

Examples of gestures

- **POINT:** used in a context to refer to something "interesting"- ***counts*** *as* a type of action **(CI-3 + SC-2)**
- **WAVE-BYE**: used in a context where ends the social interaction - ***counts*** *as* a type of action **(CI-3 + SC-2)**
- **FEED-DOLL**: used in a context where child plays by herself, play-feeding ***standing for*** feeding **(CI-1 + SC-3)**
- **ENACT-JUMP**: used in a context where child ***enacts*** a frog jumping, with her whole body **(CI-3 + SC-3)**
- **SYMBOLIZE-JUMP**: used in a context where child ***represents*** a frog jumping with her hand **(CI-3 + SC-3)**

Enact-JUMP & Symbolize-JUMP

Limits and levels of gesture and bodily mimesis (Andrén 2010; Zlatev 2007)



Mimetic schemas ≈ children's gestures?

- **Semiotic complexity**: "between" action and language
- **Granularity**: intermediate between specific movements and more abstract schemas such as PATH and VERTICALITY
- **Sociality**: both involve ***typification*** (Schutz 1953), where particular acts "count as" instances of socially acknowledged types
- **Learning**: both rely on ***imitative processes*** (imitation in a broad sense, cf. Zukow-Goldring & Arbib 2007; Andrén 2010)

Hypotheses

- Most of children's early gestures "match" overt mimetic schemas
- **Similarities and differences** in the development of (a) iconic gestures and (b) deictic and emblematic gestures, since:
  - Both (a) and (b) rely on processes of imitation and social typification

  (a) May emerge from imitation of practical actions

  (b) Learned directly as communicative actions
- Children's **iconic gestures** emerge as overt mimetic schemas, i.e. as **imitations of practical, culture-typical actions**

Empirical data

- **The Swedish-Thai multimodal corpus** (Richthoff 2000; Zlatev and Andrén 2009; Andrén 2010)
  - 3 children 18-36 months recorded 2 times a month in Gotherburg in 1990s
  - 3 children 18-30 months recorded 2 times a month in Bangkok in 2001-2002
- Chosen because of (a) availability, (b) comparability, (c) cultural differences (moderate)
- 3 data points per child: at the beginning (18 months), middle (22 months) and end (26 months) of the corpus.
- 10 minutes in the beginning of each session (6 children x 3 sessions x 10 minutes = **3 hours**)

Procedure

Step1: Identification: expression-content differentiation and/or communicative intention (cf. Andrén 2010)

Step 2: General analysis: Each gesture coded as being *predominantly*

1. ***DEI*** - communicative actions that indicate or individuate an external target
2. ***EMB*** - the existence of normative criteria for the gesture's form and meaning
3. ***ICO*** - *resemblance* between the movements of the whole body, or parts of it, and properties of actions, objects or whole events
    1. **Enacted**: "as if" practical actions
    2. **Symbolized:** hands (+ object) stand for something else

Steps 1-3: Thai (JZ), Swedish (MA)

Procedure

Step 3: Evidence for typification: similarity in both expression and meaning:

- **DEI**: IndexFingPOINT and GRAB predefined, others?
- **EMB**: types by definition, list those found
- **ICO**: given labels using English glosses that attempted to capture typified meaning (KICK, DANCE, APPLY-LOTION)
- **UNCLEAR**: possible for all levels of the analysis (DEI/ICO/EMB, Enacted/Symbolized for ICO…)

Steps 1-3: Thai (JZ), Swedish (MA)

Procedure

Step 4: Type label calibration

- Different labels that referred to the same gesture types were made identical
  - IF e.g. "JUMP" was present in one language group and absent in the other, AND a gesture in the second group was found to instantiate "JUMP" better than originally classified (e.g. "SKIP")
    THEN the gesture was re-assigned to "JUMP"
    (a few cases only!)
  - Gestures classed as belonging to "types" that were found not to be consistent across the different occurrences were demoted to UNCLEAR.

Steps 4-5: 50% of data, jointly by JZ and MA

Procedure

Step 5: Coding of imitation

- Whether a gesture was produced in imitation to the gesture of an adult or not (IMI): the presence of a gesture of the same type by an adult interlocutor in
  at most two preceding (parent) turns

Steps 4-5: 50% of data, jointly by JZ and MA

Results

Total number of gestures in the **180 min of data** (2 x 9 sessions), by language/culture group and major semiotic category

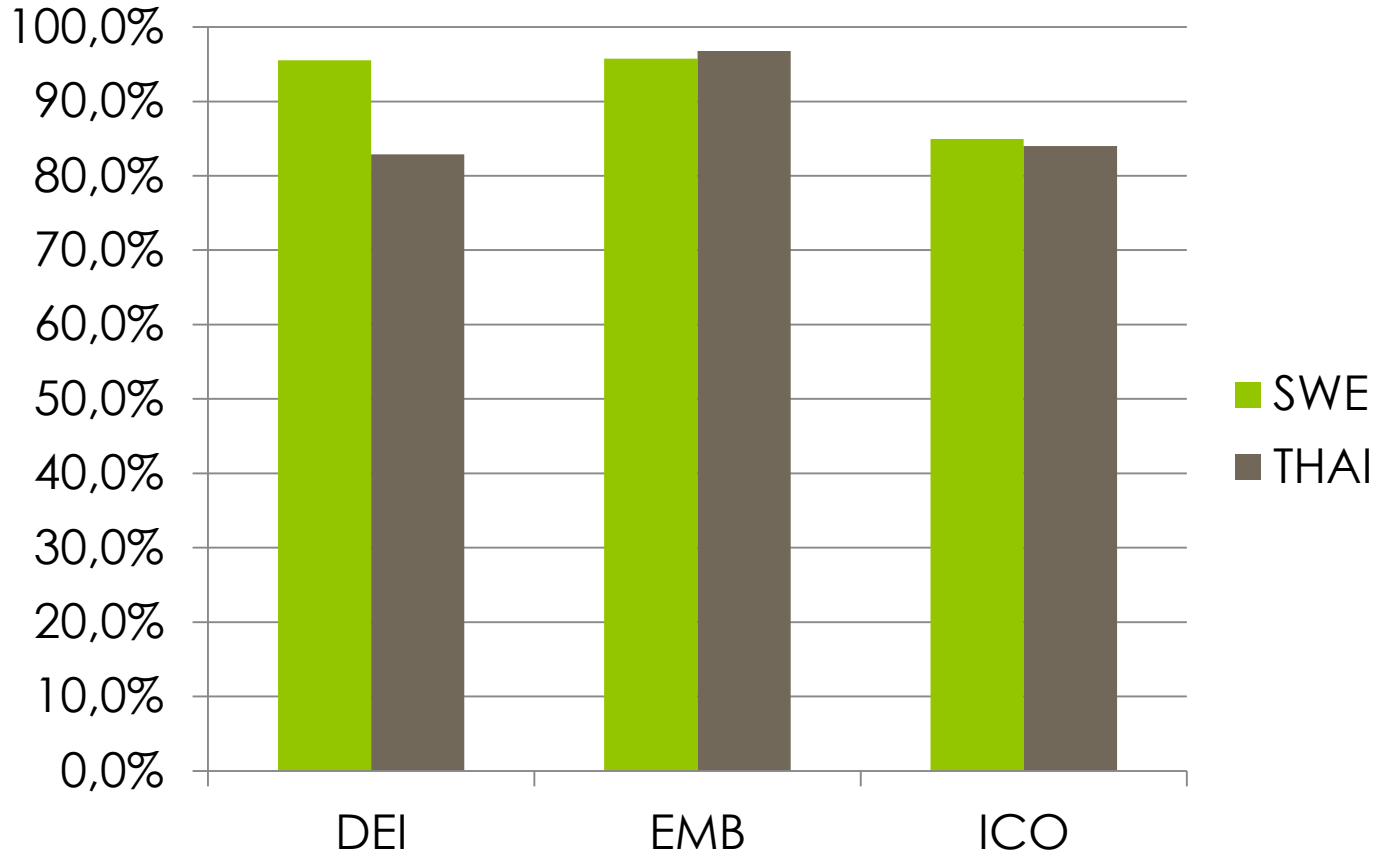
	Swedish	Thai	Total
DEI	470	146	616
EMB	118	31	149
ICO	133	75	208
Total:	721	252	973

Prediction (1)

- The majority of ICO gestures would be typified for both cultural groups. The same was expected to be the case for DEI and EMB gestures, where the latter are typified per definition. Hence, **the proportions of typified gestures for all three categories would be approximately the same**.

  For evaluating the prediction, "typified" was operationalized as (a) having **at least *two instances per type*** and (b) not coded as UNCLEAR

Prediction (1): *confirmed*



Typification levels for the three semiotic categories of gestures, for the two cultural groups

	SWEDISH GESTURES			THAI GESTURES		
Category	Types	# Sessions	# Tokens	Types	# Sessions	# Tokens
DEI	**INDEXFING POINT**	9	296	**INDEXFING POINT**	9	81
	PUT	8	39	**GIVE**	4	11
	GIVE	7	26	**SHOW**	4	9
	GRAB	6	28	REACH-TO-PERSON	3	6
	REACH-TO-THING	6	11	**GRAB**	3	4
	REMOVE	5	19	**REACH-TO-THING**	3	4
	SHOW	5	16	**SURFACE-POINT**	3	4
	SURFACE-POINT	4	5	THROW-TO-PERSON	1	2
	BEG	2	9			
Total:	9 types	9 (> 1)	449	8 types	7 (> 1)	121

	SWEDISH GESTURES			THAI GESTURES		
Category	Types	# Sessions	# Tokens	Types	# Sessions	# Tokens
EMB	**NOD-HEAD**	6	55	**SHAKE-HEAD**	5	9
	SHAKE-HEAD	5	37	**NOD-HEAD**	4	7
	DONE-CLAP	2	9	WAVE-HAND-NO	3	5
	WAVE-BYE	2	5	WAI	3	5
	WAVE-HELLO	2	2	CLAP-BRAVO	2	4
	GONE	1	3			
	THANKS-BOW	1	2			
Total:	7 types	5 (> 1)	113	5 types	5 (> 1)	30

	SWEDISH GESTURES			THAI GESTURES		
Category	Type	# Ses.	# Tok.		#Sessions	#Tokens
ICO	CHEEK-CUDDLE	3	4	KICK	3	5
	DOLL-WALK (SYMBOLIC)	2	13	DANCE	2	5
	CAR-DRIVE (SYMBOLIC)	2	12	HUG-DOLL	2	5
	DOLL-HELLO (SYMBOLIC)	2	6	SMELL-KISS	2	5
	SIMPLE-KISS	2	6	CAT-SCRATCH	2	2
	POUR	2	5	**SIMPLE-KISS**	2	2
	FEED	2	4	WAVE-AWAY	2	2
	PAT	2	4	HIT-PERSON	1	12
	STIR	2	3	APPLY-LOTION	1	6
	THROW	2	2	DOLL-DANCE (SYMBOLIC)	1	6
	DOLL-KISS (SYMBOLIC)	2	2	BITE-KISS	1	4
	SHIVER	1	10	**FEED**	1	3
	PHONE	1	7	SURPRISE!	1	2
	DOLL-JUMP-DOWN (SYMBOLIC)	1	6	SCARE-DOG	1	2
	SIT-IN-CAR	1	5	KNOCK-DOOR	1	2
	COMB	1	4			
	FEED-DRINK	1	4			
	WIPE-MOUTH	1	3			
	SING-SWAY	1	3			
	TURN-KNOB	1	2			
	DOLL-DRIVE (SYMBOLIC)	1	2			
	SEARCH	1	2			
	PUT-LID-ON	1	2			
	EAT	1	2			
Total:	24	11 (> 1)	113	15	7 (> 1)	63

Prediction (2)

- **Many, though not all, of the types found would be specific to each cultural group**, since mimetic schemas arise "locally" through imitation processes.
- Results
  - 6 DEI and 2 EMB types were shared.
  - **Only 2 of the large number ICO types were attested in both data sets: FEED and KISS** (*But: under-sampling?*)
- **Supported (at least as tendency)**

Prediction (3)

- **Enacted** ("character viewpoint") ICO gestures would both
  - **(a) outnumber**
  - **(b) developmentally precede Symbolic** ("observer viewpoint") ICO gestures

- **Symbolic: 5 of 24** types (Swedish) and **1 of 15** (Thai)
- All of these involved the **playing with a toy**, such as a doll or a car, rather than a body-part to stand for something else, as typical for adult Symbolic gestures

Prediction (3a): *confirmed*

	SWEDISH GESTURES			THAI GESTURES		
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	SIMPLE-KISS	2	6	CAT-SCRATCH	2	2
	POUR	2	5	**SIMPLE-KISS**	2	2
	FEED	2	4	WAVE-AWAY	2	2
	PAT	2	4	HIT-PERSON	1	12
	STIR	2	3	APPLY-LOTION	1	6
	THROW	2	2	DOLL-DANCE (SYMBOLIC)	1	6
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	SHIVER	1	10	**FEED**	1	3
	PHONE	1	7	SURPRISE!	1	2
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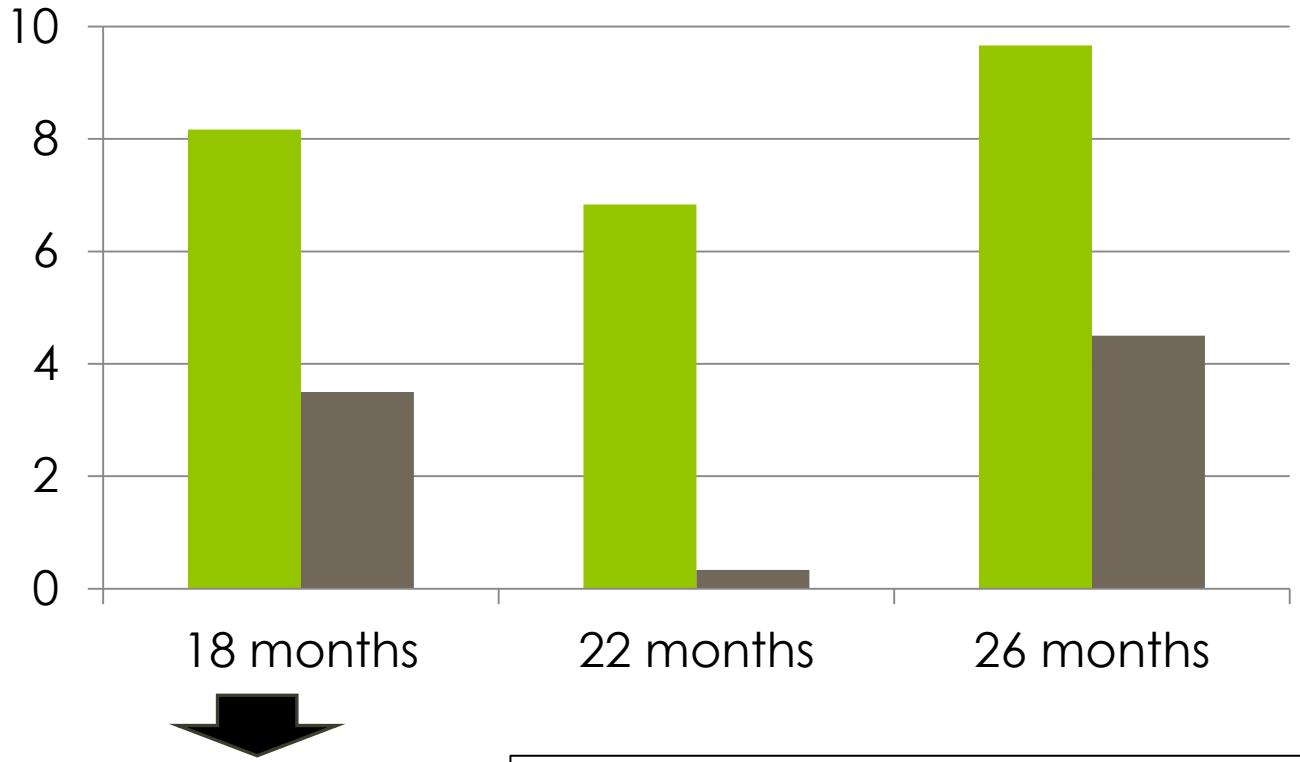
	SIT-IN-CAR	1	5	KNOCK-DOOR	1	2
	COMB	1	4			
	FEED-DRINK	1	4			
	WIPE-MOUTH	1	3			
	SING-SWAY	1	3			
	TURN-KNOB	1	2			
	DOLL-DRIVE (SYMBOLIC)	1	2			
	SEARCH	1	2			
	PUT-LID-ON	1	2			
	EAT	1	2			
Total:	24	11 (> 1)	113	15	7 (> 1)	63

Zlatev (in press)

Prediction (3b): *confirmed*



Very few explicit signs (SC-3)??

Average number of **Enacted** and **Symbolic** Iconic Gestures per session (10 min) for the three age periods for Thai and Swedish data combined

Prediction (4): *confirmed*

- **The majority of ICO types would be "*fairly specific*" in granularity, corresponding to practical actions.**

- In contrast with what would be expected from an image-schema analysis: more abstract and universal types such related to schemas such as PATH, CONTAINER and VERTICALITY.

	SWEDISH GESTURES			THAI GESTURES		
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	SEARCH	1	2			
	PUT-LID-ON	1	2			
	EAT	1	2			
Total:	24	11 (> 1)	113	15	7 (> 1)	63

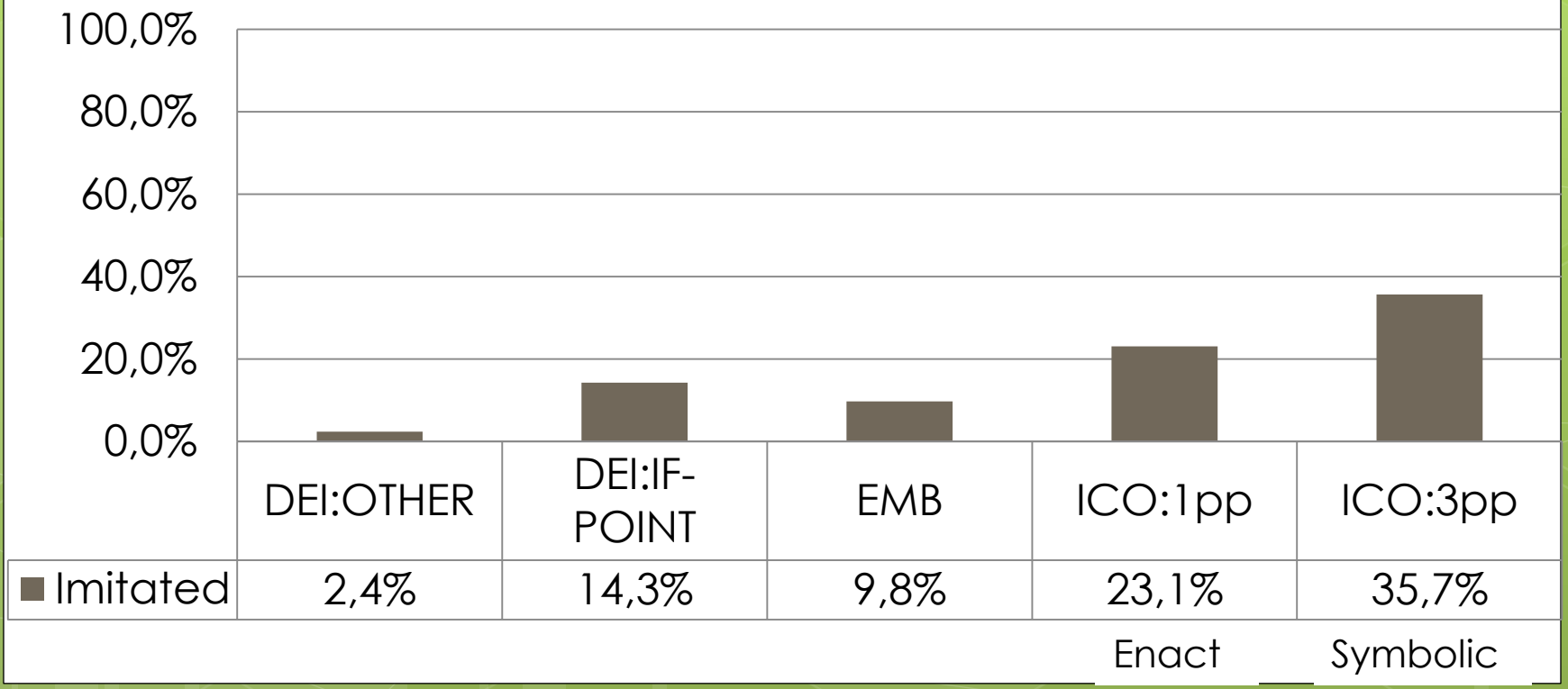
Prediction (5)

a. Greater dependence on imitation for Symbolic than Enacted ICO
b. Greater dependence on imitation for ICO than DEI & EMB

- Assuming that:
  - ICO (Symbolic) are mostly learned through direct imitation
  - ICO in general are more dependent on imitative processes than DEI and EMB (in this stage of development)

Prediction (5): *confirmed*

a. Greater dependence on imitation for Symbolic than Enacted ICO
b. Greater dependence on imitation for ICO than DEI & EMB



From Enact to Symbolize via direct imitation (BEL 23;07)

Conclusions (1)

- The first iconic gestures **fall into socially shared types.**
- These are **on the level of specific actions**, such as kicking, kissing, dog-scaring etc.
- Most early iconic gestures are **initially Enacted (1pp) and only later Symbolized (3pp).**
- Some are common to both language/culture groups, but **some were culture-specific**.

All this is consistent with the hypothesis that children's iconic gestures emerge as overt mimetic schemas rather than as image schemas.

Conclusions (2)

- First ICO gestures:
  - much closer to specific, **practical actions**
  - more **open-ended** repertoire of types
  - initially not **representations (signs), but schemas associated with contexts (and words)**
- Early DEI (and EMB) gestures:
  - not so much representations as **performative communicative acts**
  - **fewer** types (relatively "closed-class")
  - **less reliance on direct imitation** (at least during the period of study)

Communicative Intent and Semiotic Complexity

DEICTIC GESTURES — **EMBLEMS (?)** — **ICONIC GESTURES**

Level	Communicative intent (CI)
CI-3	Explicitly other-oriented action (Clear communicative intentionality)
CI-2	Action framed by mutual attunement (Unclear communicative intentionality)
CI-1	Side effect of co-presence (No visible communicative intentionality)

Level	Semiotic Complexity (SC)
SC-3	Explicit signs: Expression E **stands for** meaning M
SC-2	Typified acts: Expression E **counts as** doing action A
SC-1	Situation-specific acts: Expression E…

Grounded in embodied/enacted communicative intent

Grounded in mimetic schemas

Conclusions (3)

- While imitation (processes) indeed appear to be crucial for the development of all three categories of gestures, ***what is imitated is not of the same kind.***
- This would indeed imply that DEI and EMB gestures do not follow the same developmental trajectory as ICO gestures, and can therefore **not be claimed to "correspond to" or "emerge from" mimetic schemas** (pace Zlatev 2005)
- While a broad notion of (bodily) mimesis is relevant for the development of all gestures, ***only ICO gestures are (eventually) representational and emerge as mimetic schemas.***

From Imitation to Sign Use?

"The Internalist Route"

(1) **sensorimotor imitation:** in which the model's action is imitated immediately;

(2) **deferred imitation**: in which the performed action is a copy of an action removed in space and time, either of another, or of oneself;

(3) **representational imitation:** in which "the interior image precedes the exterior gesture, which is thus a copy of an 'internal model' that guarantees the connection between the real, but absent model, and the imitative reproduction of it." (Piaget 1962: 279).

Concepts like: **"symbol"** (Piaget 1945), **"mimetic schema"** (Zlatev 2005), **"inner imitation"** (Gallese 2009)

From Imitation to Sign Use?

"The Externalist Route"

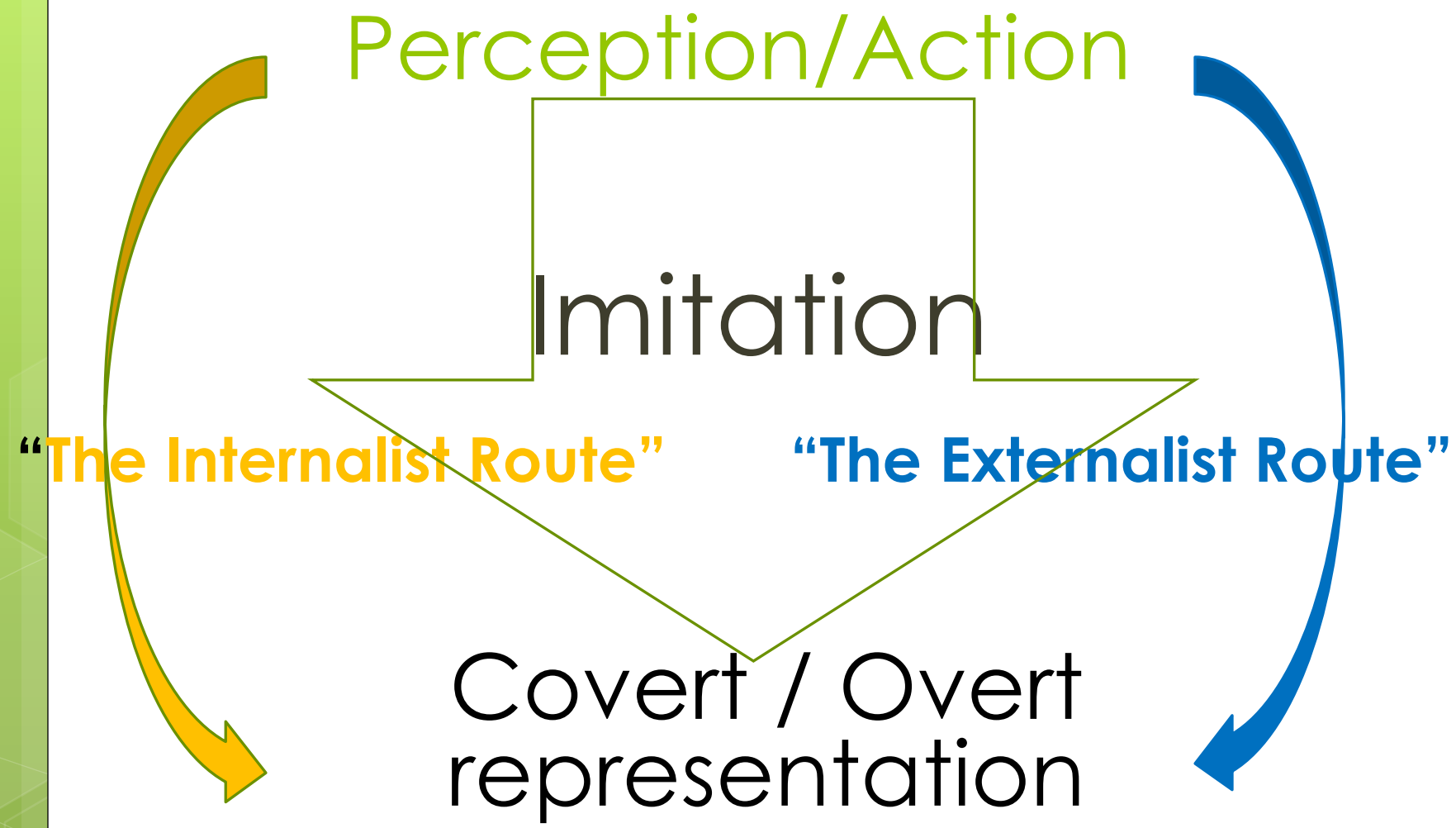
(1) **imitation of instrumental action** (imitative learning)
"I do like you do with Object"

(2) **role-reversal imitation** (communicative, non-representational)
"I do towards you like you do towards me"

(3) **symbolic play** (non-communicative, representational)
"action A means M for me/us"

(4) **imitation of symbolic gesture + role-reversal**
"I mean M by doing E for you (like you do for me)"

Concepts like **"communicative intent"** and **"symbolic insight"**


Perception/Action
Imitation
"The Internalist Route"
"The Externalist Route"
Covert / Overt representation

Both “routes” are necessary

- **Covert representation**
  - mental reenactment (e.g. for skill learning)
  - novel iconic gestures (externalization of mental mimetic imagery), especially re-enacted ones

- **Overt representation**
  - symbolic play
  - recurrent, typified, and eventually conventional expression-function pairings (= signs)

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