

Nods, headshakes and the perception of multimodal constructions in child language

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Background

- Emblems are gestures often claimed to have a verbal equivalent (word or phrase) [e.g., 1, 2]. In this emblems differ from so called co-speech gestures [e.g., 3, 4, 5]. Emblems are also less explored from a developmental perspective.
- Nodding = “yes” and Headshakes = “no” are two early emblematic gestures in child communication but little is known about their functions and trajectories in different context and for different ages [6, 7].
- In laboratory settings and dyadic child-parent interaction, the following uses for nods and headshakes have been documented [6, 7, 8]: i) Willingness or refusal to carry out a requested behavior; ii) Agreement or disagreement with substantive claims or with a behavior performed (including backchannel responses); iii) Answer to yes/no-questions; and, iv) Reinforcing a statement (negative or affirmative).

Research questions

- How frequent are nods and headshakes in naturalistic child interaction?
- How do children use nods and headshakes in naturalistic interactions with siblings and parents?
- How are nods and headshakes related to children's age?

Methodology

Participants

11 Swedish children, 0;9-5;10 years old, 5 families. 7 girls/5 boys. In all 22 hours.

Design

4-6 rec./child, longitudinal study 2 ½ years, home environment. One video camera were used, the researcher followed the children.

Coding

Transcribed in ELAN. All verbal and vocal utterances were transcribed orthographically. Something was regarded as 1 verbal/vocal utterance if it was preceded and followed by silence, change of turns, etc.

All nodding and head shaking movements the children made were tagged NOD or HEADSHAKE respectively. A nod was defined as at least one up-down movement of the head, a head-shake as at least one back-and-forth turn of head sideways (sound was turned off during this part of the annotation process). One coder.

Analysis

All NODs and HEADSHAKES were analyzed in context for “yes”/“no” meaning or possible other semantically/ interactionally related function. The children were divided into age groups for simplicity reasons. Adult gestures are not included in this study.

Results

Frequencies

There were 116 nods and 136 headshakes. In total (including all 11 children) there were 5,3 nods per hour and 6,2 headshakes, equaling a nod every 11th minute and a headshake every 10th minute.

Functions

Nods: “yes”; feedback-signal; emphasis (non-speech); question; co-speech but not “yes”; other.

Headshakes: “no”; feedback-signal; emphasis (non-speech); question; co-speech but not “no”; mismatch; other.

There are more prototypical nods (meaning “yes”) than atypical, whereas the opposite relation holds for headshakes. Children, 1 to 6 years old, shake their heads a lot without this having a clear relation to “no” *in situ*.

Development

No statistical analysis has been done yet (but at least headshakes appear to be a mess).

Different kinds of nodding gestures

Nod types	0;9-1 years old	1;1-2 years old	2;1-3 years old	3;1-4 years old	4;1-5 years old	5;1-6 years old	Number of type / occurrences of nod-gestures
Nod-AP*	0/0	0/0	11/18 61%	20/35 57%	23/47 49%	7/16 44%	61/116 53%
Nod-“yes” comment	0/0	0/0	2/18 11%	5/35 14%	10/47 21%	3/16 19%	20/116 17%
Nod-emphasis (after speech/nod)	0/0	0/0	0/18 0%	1/35 3%	2/47 4%	1/16 6%	4/116 3%
Nod-question	0/0	0/0	0/18 0%	0/35 0%	0/47 0%	1/16 6%	1/116 1%
Nod-co-speech nod (excluding “yes”)	0/0	0/0	4/18 22%	8/35 23%	10/47 21%	3/16 19%	25/116 22%
Nod-other	0/0	0/0	1/18 6%	1/35 3%	2/47 4%	1/16 6%	5/116 4%

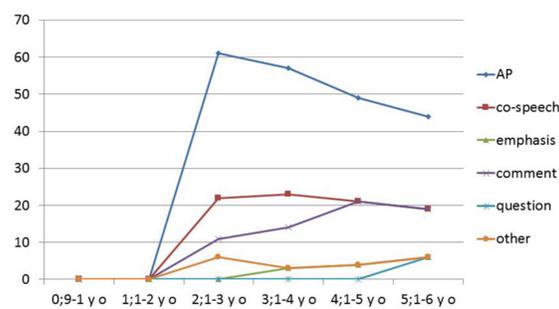
*Adjacency Pair

Different kinds of head shaking gestures

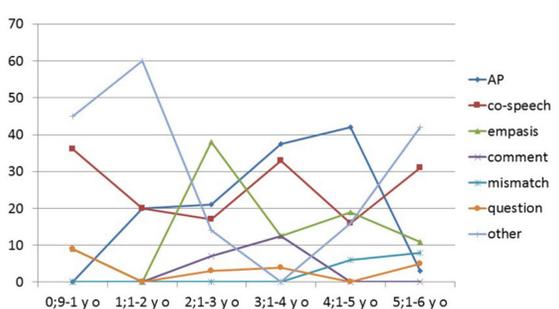
Head shake types	0;9-1 years old	1;1-2 years old	2;1-3 years old	3;1-4 years old	4;1-5 years old	5;1-6 years old	Number of type / occurrences of head shake-gestures
Head shake-AP*	0/11 0%	1/5 20%	6/29 21%	9/24 37,5%	13/31 42%	1/36 3%	30/136 22%
Head shake-“no” comment	0/11 0%	0/5 0%	2/29 7%	3/24 12,5%	0/31 0%	0/36 0%	5/136 4%
Head shake-emphasis	11/11 9%	0/5 0%	11/29 38%	3/24 12,5%	6/31 19%	4/36 11%	25/136 18%
Head shake-question	11/11 9%	0/5 0%	1/29 3%	1/24 4%	0/31 0%	2/36 5%	5/136 4%
Head shake-co-speech shake (ext “no”)	4/11 36%	1/5 20%	5/29 17%	8/24 33%	5/31 16%	11/36 31%	34/136 25%
Head shake-mismatch	0/11 0%	0/5 0%	0/29 0%	0/24 0%	2/31 6%	3/36 8%	5/136 4%
Head shake-other	5/11 45%	3/5 60%	4/29 14%	0/24 0%	5/31 16%	15/36 42%	32/136 23%

*Adjacency Pair

Development: Nodding gestures



Development: Head shaking gestures



Discussion

Frequencies

The majority of nodding gestures were produced inside constructions such as question-answer. Why headshaking gestures do not appear as frequently inside these constructions is harder to understand. Do we prefer to ask Y/N-questions when we expect a positive reply? Or do children prefer to utter “no” rather than to use a head gesture when refusing something? Are affirmative comments/feedback in general more frequent than negative?

Previous studies on gesture frequencies tend to find a much higher degree of gestures per utterance or time frame. These studies are mostly conducted on dyadic interaction in laboratory settings, which might explain the difference. More naturalistic studies are needed in order to test this further.

Functions

The functions found in this data corresponds to those observed in 32 months olds children [6] and to the mothers head gestures while interacting with their young children [7]. However, there were also a few mismatch uses of the headshaking gesture. There were also quite a few Other-gestures. These were partly grooming behavior (among the older children), partly “unknown”. 22% of the nods and 25% of the shakes were of co-speech character, either beats or more off-rhythm movements (nods) or of unclear function (headshakes). Do the nods carry semantic meaning or are they interactional spam? If the shakes negate, they negate larger chunks of discourse or they indicate a personal (emotive) stance.

Going abstract: most prototypical nods/shakes are found in adjacency pair constructions. These constructions are also the reason we regard nods/headshakes as emblematic gestures. Outside these stable interactional frames, it appears we either do not notice the nodding/shaking movements [Gerholm, in prep] or they take on the semantics of the concurrent - or closest - verbalizations. Will we find the same if investigating other emblems in naturalistic settings?

Development

Nods appear to be much more stable in their use than headshakes, both in mothers behavior [7] and in the present data. The suggested interpretation [7] was that the gestures “serve very different functions, even within one parent-child interaction, and are responses to different elicitors.” The trajectory of head gestures in these 11 Swedish children would indicate something similar: the head gestures, although belonging to a “set” in regard to yes-no semantics, do behave differently in interaction. Why this is so warrants further investigations.

Further studies

- The relation between form and meaning for emblems such as nods and headshakes need be investigated further. The description of emblems as equivalent to specific words/ meanings holds only for particular contexts.
- Naturalistic settings need be compared more systematically to laboratory settings. The difference in frequencies and functions could be large.
- The contexts in which the present gestures were found need be studied more in depth, e.g. including the interactants' gesture-speech behavior. Are there an imitation tendency for nods/shakes?

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