The emergence of negation comprehension in infancy

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While linguistic negation is a fascinating tool expressing an immense variety of meanings, we know little about how these thoughts emerge. In this work, we aimed to investigate the acquisition and the nature of the first meanings of negation. According to one hypothesis, infants start with a limited understanding that is mapped onto specific meanings, like non-existence (i.e. absence of entities, 'No cookies'). Months later, they acquire a more abstract and general-purpose concept of negation (i.e. propositional denial, 'Not *x*'). Alternatively, infants' might possess a general understanding of negation from very early on, and might operate with the same concept while they acquire different linguistic forms.

In the present study we investigated the emerging comprehension of two types of negation: non-existence and general-purpose negation. We were looking for potential evidence for limitations, or for an early rich understanding in infants.

In Study 1 we tested Hungarian 15-18-month-olds' comprehension of negation expressing to the absence of objects – a thought difficult to capture without negation. We tested the understanding of negation specifically expressing non-existence (the Hungarian negative existential 'Nincsen') and the understanding of the general-purpose denial ('Nem itt van'). We found a parallel development for understanding syntactically and functionally different negative utterances. While 18-month-olds succeeded to comprehend both types of negation, 15-month-olds failed. Interestingly, we found Hungarian learners comprehension of negation 6-18 months earlier than it was reported in previous studies investigating English learners performing different tasks. In Study 2 we asked whether language and task specific factors could explain the difference between the present and former investigations. English learner 18-month-olds participated in the very same task we used in Study 1. We tested the comprehension of denial ('It is not here') and the comprehension of negation expressing non-existence ('All gone'). While infants did not show evidence for comprehending negation in the former case, they did succeed in the latter. However, the pattern of performance in comprehending denial is more similar to the one observed at the age of 20-24 months. Thus, both task specific details and language differences influence the performance of negation comprehension at this young age.

Regarding our main question, whether infants have a transitional/limited or a full-blown/general-purpose understanding of negation, it is difficult to interpret two different developmental paths. Peculiarly, Hungarian learners acquired the two types of negation parallel, while English learners showed evidence for an earlier capacity to comprehend non-existence compared to denial. A plausible explanation is that representation of absence is available for infants, before they acquire linguistic negation, and 'All gone' is mapped on such a representation. In contrast, the negative existential (i.e. 'Nincsen') – used for a specific meaning – might have the same conceptual underpinning as the negative particle ('Nem') used in a broader context.

Our findings point to human infants' preparedness for acquiring a rich understanding of negation (i.e. syntactically and functionally different negative utterances) referring to absence, likely based on domain general cognitive and linguistic tools. Additionally, from our results it seems that encoding absence is neither language- nor negation-dependent ability.