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COGS 184

Week 6 Commentary - Falk

Motherese—“baby talk”—is a subject of debate in its potential role in the development of language. While motherese exists in other non-human primates, it likely survived a larger role in our evolutionary history. Human infants both cannot cling to their mother’s fur and mothers may not be able to carry infants while foraging. Because of this, mothers may have had to put their infants down which led to the need for infants in vocalizing their needs, capturing their mothers attention, and having those needs met because of the distance.

Infant directed vocalizations of chimp mothers are similar to that produced by infants. Bonobo mothers are very sensitive to the screams of their infants and will also emit vocalizations in alarm situations to elicit responses from offspring. While bonobos and chimps have vocalization abilities and a rich repertoire, there isn’t much evidence to show that many vocalizations are directed towards their infants. Instead, they employ infant-directed gestures to communicate.

Human infants prefer infant-directed speech over adult-directed speech likely because the infant form is simplified, repetitive, exaggerated, slow, and tonal. Because it is less on the content of the speech, infants attend to what is pronounced, lengthened, or highlighted along with visual and tactile cues. Like lullabies, this slower, punctuated speech is more emotional and less linguistic. Infants are initially more interested in the melodic and exaggerated prosodic patterns of this speech than meaning or grammar.

The emphasis on the structure, flow, and emotion may help to enforce babbling rhythms and turn-taking. Additionally, the author notes that interpreting the emotion of a vocalization is a mechanism through *semantic bootstrapping*: mapping sounds onto mental semantic concepts. I wish Falk had dug into this a bit more because this seems to be way to connect emotion to semantic and therefore, gestures/motherese to proto-language.

One of the most important points that Falk makes is on the multi-modal essence of communication. Motherese isn’t just aural; infants watch their mother’s faces and mouth, look at gestures, use gestures while responding, interpret tone, etc. Additionally, there is evidence that, like we saw in COGS 184 (and COGS 17) motor and speech are tied. First, manual gestures in infants is accompanied by increased use of vocalizations (before words). Crying (a vocalization) increases the strength of the

grasping reflex in human infants. Many authors might use the evidence of motherese to suggest that these vocalizations were a form of proto-speech that gave rise to proto-language. However, Falk is very clear in that motherese is not important because of the words or speech but in all the factors that surround it that encourage infants to become attuned to emotion and context as well as the rhythm that may help scaffold grammar.

Another critique I have is similar to one of the commentaries: the lack of the infant's affect on the mother. The central thesis of Falk regarding motherese is that bipedal mothers put their babies down and prosodic vocalizations replaced physical arms for comforting ones or gestures for alerting infants. Falk never mentions the other side: how do infant vocalization affect and select for the behavior of mothers. Mothers rarely command children to behave through speech. It's often mothers trying to deal with the speech, cries, and babbles of infants. In an allopatric world, infants would need to curate bonds with other members but lack the language to speak their needs. They would have to find ways of communicating their needs to those not their own mother.

Something I never considered was the role of laughter in infants. We know that laughter is a common element of play (though I had never heard that apes laugh more than humans during play). Per our discussion of babbling in COGS 184, infants babble even to themselves potentially as a way to practice and build up the ability to refine that motor control or learn how to make use of their vocal chamber. If crying and laughter are opposites and crying works well in capturing a mother's attention, what role does laughter serve?

My hypothesis is that sustained cries do not produce the right effect. Initial cries pull the mother's attention and may give the infant what they need or the mother may try to calm it. However, over time, the mother will be less likely to respond. If both cries and laughter share the same features of tearing and rhythmic vocalizations, and cries cannot be sustained, maybe laughter is the way in which infants can practice the control of these rhythmic vocalizations without the negative implications cries have. Laughter (and crying) allow them to learn to use their lungs and vocal apparatus and build up those abilities.

One final point about laughter is its role in allopatric relationships. If mothers often need to forage or put their child down, others may be involved in caring for the child. If crying and laughter are like babbling, infants need continuous practice but they also need to construct social bonds so they won't be abandoned. Laughter may be a

proximal mechanism in that it feels good to do and be around. Therefore, infants who produce laughter may be more likely to form social bonds because of its positive effect. This may have selected laughter as another form of building up tearing and rhythmic vocalizations given the context of absent mothers. However, these are just my predictions and may be incorrect.

One thing I was confused about was the heritability of the grey matter in Broca's and Wernicke's. The second premise suggested that early hominid mothers "would have a genetically based potential for modifying vocalizations and gestures consciously to control infants is consistent with recent studies that suggest that pitch discrimination is highly heritable". How is pitch heritable? Is it simply that infants start to only discriminate the phonemes of their native language—as we learned in COGS 101A + 184? Is it that the white matter connections between Broca's and Wernicke's reflects the mother's as it represents prioritizing the native language? Otherwise, I don't see how this is heritable but simply conditioned.

Sherman Wilcox commented, in "Language from Gesture", the two core findings of Falk's argument. First, that mother-infant communication is multi-modal—it's not visual gestures but aural, visual, and tactile too. This may suggest that gestures helped to give rise to proto-language (as it is also very multi-modal). However, intonation is a key element of motherese (and very multi-modal in the inflections used, facial expressions, etc.) and borders paralinguistic and linguistic behaviors. This likely was a precursor—or a prerequisite—to proto-language. Second, gesture may have given rise—or been a part of—intonation which provided the scaffolding to learn grammar (as we attend to different parts).

David Spurrett and Andrew Dellis made a number of critiques in "Putting Infants in Their Place". First, the most striking critique is that of the loss of autonomy and impact of infants. The discussion in Falk's paper surrounds the actions of the mother in finding the balance between her survival (needs to forage) and the care of her infant. The "putting down the baby hypothesis" suggests that mothers who were good at vocal comforting may have been freed to forage more effectively which would result in greater fitness (and therefore be selected for). However, this doesn't speak to the autonomy of infants. It's also very likely that, on the other end, infants who were good at vocalizing their needs and elicited maternal care would have been fed more or had more success. Both parties had much to gain from compelling vocalizations.