Motherese is but one part of a ritualized, multimodal, temporally organized, affiliative interaction

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Abstract: Visual (facial), tactile, and gestural, as well as vocal, elements of mother-infant interactions are each formalizations, repetitions, exaggera- tions, and elaborations of ordinary adult communicative signals of affilia- tion – suggesting ritualization. They are temporally organized and enable emotional coordination of the interacting pair. This larger view of motherese supports Falk's claim that the social-emotional elements of language are primary and suggests that language and music have common evolu- tionary foundations.

Falk's article emphasizes the important roles of visual, gestural, and tactile signals to infants, in addition to the vocal aspects that have been the primary locus of language origin studies. Her argu- ments about the importance of sociality and affect in mother-infant prelinguistic interchanges would be strengthened if they also incorporated provocative evidence that in the interactions these multimodal behaviors are *temporally coordinated*. If mothers "[modify] their vocal and gestural repertoires to shape and consciously control" infant behavior (sect. 3.2.1), it can be pointed out that shaping and controlling are temporal processes.

Infants are born prepared to engage in temporally organized in- teractions (Trevarthen 1997; 1999). Desynchronization experi- ments reveal that infants as young as 4- to 8-weeks old (Murray & Trevarthen 1985) expect social contingency, defined as "interpersonal sequential dependency," in which the behavior and affect of both partners (as expressed in face, voice, and bodily movement) are coordinated or "attuned" (Jaffe et al. 2001, pp. 13–14; Stern et al. 1985). When normal ongoing playful interaction via dual video is experimentally desynchronized (i.e., the baby is presented with a slightly delayed replayed recorded sequence of just-experi- enced positive interaction with the mother), 6- to 12-week-old in- fants show signs of psychological distress such as averted gaze, closed mouth, frown, grimace, fingering of clothing, and the dis- placement activity of yawning (Murray & Trevarthen 1985; Nadel 1996; Nadel et al. 1999). This emotional/behavioral coordination is more than "social." It is *relational,* and, like motherese (which is but one element in the engagement), it has developmental ben- efits and adaptive implications.

I have argued (Dissanayake 2000; 2001) that mother-infant in- teraction is a ritualized behavior like those described by etholo- gists (e.g., Eibl-Eibesfeldt 1989, pp. 439 – 40; Tinbergen 1952) for other animals, in which behaviors from one context (here, ordi- nary communicative indications of adult friendliness or readiness

for contact) are altered – simplified or stereotyped, repeated, ex- aggerated, and elaborated – and take on new meaning in a new context (here, mother-infant interaction). The "ritualized" facial expressions of adults in interactions with infants typically include widened eyes, raised eyebrows, and a sustained open mouth or smile, all of which in their

unritualized form indicate affiliation or friendly intention. Gesturally, adults sharply bob back their heads or nod rhythmically to infants, again presenting an exaggeration of head movements that conventionally signal affiliation in adults. Adults lean toward and away from an infant and give rhythmic touches and pats – again, friendly human gestures that are also common in many nonhuman primates. Vocalizations to infants by human mothers, as Falk describes, are soft, breathy, undulant and inviting, or soothing, with much repetition – that is, exaggerations of nonthreatening and affiliative adult utterances.

These components of mother-infant interaction do not occur in isolation, and they appear to be processed crossmodally (Schore 1994), as the pair co-create and share a common pulse and emo- tional quality which Trevarthen and Malloch (2000) call "affecting chains" or sequences of expression.

Ritualized, multimodal, temporally coordinated interactions are important in their own right at 4 to 12 weeks of age, long be- fore they are co-opted and altered further for didactic language- learning purposes at age 5–8 months and later. Falk remarks (sect. 2.2) that ID speech contributes initially to emotional regulation, then to socialization, and finally to the organization of speech. If for "ID speech," one substitutes "the package of ritualized behav- iors, including temporal, dialogic, and emotional aspects," one fur- ther emphasizes the importance of the emotional (prosodic) ele- ments of speech (phylogenetically and ontogenetically), and its dialogic nature – overlooked aspects that Falk seeks to remedy.

Incorporating this additional evidence of the social-emotional nature of the interaction also supports Falk's suggestion that motherese could have been a precursor to (or antecedent of) the social grooming origin and function of language. It additionally supports suggestions that music and language have a common evolutionary foundation (Morley 2002).

Falk describes well in section 3 the anatomical changes in bipedal, large-brained hominins that required new adaptive strategies for the survival of relatively undeveloped infants. If mothers made ritualized affiliative signals in several modalities to their infants, they would concurrently reinforce affiliative circuits in their own brain; infants in turn would respond affectively, dis- playing their interactive lovability and thereby attracting maternal care. Co-creating a dialogue within a common pulse would further coordinate the affective state of the participants, promoting will- ing maternal care (i.e., infant survival and maternal reproductive success). Even today, neurobiologists describe the pathological ef- fects to infants of defective interactive abilities of either infant or mother (Aitken & Trevarthen 1997, Koulomzin et al. 2002; Schore 1994; Trevarthen & Aitken 1994) corroborating others' findings about the beneficial effects of mother-infant interaction.

I suggest that putting the baby down and interacting vocally at a distance would have come, evolutionarily, *after* the establish- ment of ritualized mother-infant interaction as described here. The importance of face-to-face communication is evinced in "still face" experiments with 2- to 9-month-old infants (Murray & Tre- varthen 1985; Tronick 1989), in which an expressionless mother provoked infant distress, and also in the prominence of

mutual gaze, a striking feature of mother-infant interaction in many if not all cultures. Falk points out that "mothers unconsciously estab- lish eye contact with infants and then use motherese to maintain joint attention" (sect. 2.2). Actually, however, the capacity for "sustained mutual visual regard" – normally a threat signal, al- though it also appears in affiliative contexts in bonobos – is pre- sent by approximately the second month (Beebe 1982, p. 171). Accompanied by adult smiling and soft, repeated vocalizations, mutual gaze in an infant's early weeks accomplishes more than joint attention. Some researchers consider face-to-face commu- nication and / or mutual gaze critically important to subsequent

infant socioemotional development (e.g., Cohn & Tronick 1987; Schore 1994).

These comments are meant not to challenge Falk's original and stimulating ideas, but, rather, to suggest other supportive avenues for consideration and exploration. Future studies of the nature, function, and origin of language would do well to recognize, as Falk does, the importance of its social and emotional elements.

From *Behavioural and Brain Sciences* 2004. Vol. 27(4): 512-513.
Peer Commentary to Target Article by Falk, Dean. "Prelinguistic evolution in early hominins: Whence motherese? Pp. 491–541 .

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