

# **Cross-Cultural Evidence for Multimodal Motherese: The Role of Temporal Synchrony between Verbal Labels and Gestures.**

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## **Abstract**

Gogate, Bahrick, and Watson (2000) found that American mothers of pre-lexical infants (5-8 months) taught their infants novel words using temporal synchrony between the spoken words and objects' motions (multimodal motherese) more often than mothers of lexically advanced infants (21-30 months). In the present study, we examined the communicative interactions between Asian-Indian mothers and their infants living in India to obtain cross-cultural evidence for multimodal motherese. The results revealed a highly significant interaction between infants' age and maternal communication type, showing that Indian mothers adapt their bimodal communication to their infants' ability to detect word-referent relations. Mothers of pre-lexical infants used temporal synchrony more often than mothers of infants who were lexically advanced. Thus, the multimodal communication of Indian mothers, similar to that of American mothers, may serve to highlight word-referent relations for young infants. In contrast, mothers of lexically advanced infants named objects and actions while holding a static object more often than mothers of pre-lexical infants. These infants likely have other means for gleaned word-referent relations and may not require maternal highlighting of these relations. The findings provide converging and cross-cultural evidence for mothers' use of multimodal motherese when teaching their pre-lexical infants novel words that refer to objects or actions, and suggest that mothers adapt their communication to their infants' ability to relate words and their referents.

## **Introduction**

Gogate, Bahrick, and Watson (2000) found that American mothers of pre-lexical infants (5-8 months) taught their infants novel words using temporal synchrony between the spoken words and objects' motions (multimodal motherese) more often than mothers of lexically advanced infants (21-30 months). These findings suggested that mothers' use of multimodal communication is adapted to their infants' ability to detect word-referent relations.

Specifically, multimodal motherese may serve to highlight word-referent relations for infants at an age when they are unable to detect these relations on their own. In the present study, we examined the communicative interactions between Asian-Indian mothers and their infants living in India to obtain cross-cultural evidence for multimodal motherese. We were interested in whether in this South-Asian culture, where mothers do not explicitly teach words to their infants as in Western cultures, mothers still adapted their multimodal communication to their infants' lexical mapping ability.

## **Method**

Twenty-four mothers and their infants participated. There were eight infants in each of three

age groups, 5-8 months, 9-17 months, and 19-43 months. These age groups represented three levels of lexical-mapping development, pre-lexical, early-lexical, and advanced-lexical, respectively. Identical to the prior study (Gogate, Bahrick, & Watson, 2000), following a 5-min. free-play episode mothers were asked to teach their infants novel names (gow and chi) for two objects, and novel names (pru and flo) for two distinct actions, during a 5 min semi-structured play episode (Figure 1).

**Figure 1**

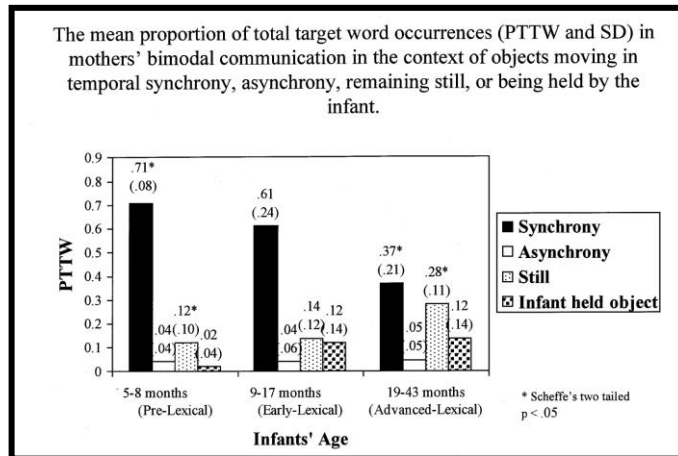


The episodes were video taped. Trained observers coded mothers' bimodal communications for temporal synchrony (ms), temporal asynchrony (ma), naming of objects or actions when objects were held static (so), and naming of objects held and manipulated by the infant (iho). Interobserver reliability was calculated for two coders' proportions of these communication types across eight mothers' communications (33% of the data). The mean correlation (Pearson  $r$ ) was .97 (SD = .05).

## Results

The proportions of total target-word tokens (PTTW) were derived by dividing the number of occurrences of each bimodal communication type (for each dyad) by the total number of target word tokens summed across all types (ms, ma, so, iho). A repeated measures analysis of variance on the PTTWs by infants' age (3), and maternal communication type (4) revealed no significant effect of age ( $F(2, 21) = .75, p > .1$ ), but a significant effect of communication type ( $F(3, 63) = 63.93, p < .0001$ ). A post hoc analysis of communication types (Scheffe's  $p < .05$ ) revealed that infants of all ages received synchronous communications more often than other types. More importantly, the analysis revealed a highly significant interaction between infants' age and maternal communication type ( $F(6, 63) = 5.18, p < .0001$ ), showing that Indian mothers adapt their bimodal communication to their infants' ability to detect word-referent relations (Figure 2).

**Figure 2**



Post hoc analyses revealed that mothers of pre-lexical infants used temporal synchrony more often than mothers of advanced-lexical infants ( $p < .05$ ). Thus, Indian mothers' multimodal communication, similar to that of American mothers, may serve to highlight the arbitrary relations between objects or actions and their referents for young infants. In contrast, mothers of advanced-lexical infants named objects and actions holding a static object (so) more often than mothers of pre-lexical infants ( $p < .05$ ). These infants likely have other means for glean word-referent relations and may not require maternal highlighting of these relations.

## Conclusions

These findings provide converging and cross-cultural evidence for mothers' use of multimodal motherese when teaching their pre-lexical infants novel words that refer to objects or actions. Furthermore, these findings provide converging evidence to show that as infants become older and learn to detect word-referent relations, mothers adapt their communication by showing a significant decrease in their use of multimodal motherese.

## Reference

Gogate, L. J., Bahrick, L. E., and Watson, J. D. (2000). A study of multimodal motherese: the role of temporal synchrony between verbal labels and gestures. *Child Development*, 71 (4), 876-892.

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