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THE FUNCTIONAL USES OF INFANT-DIRECTED SPEECH OF FATHERS AND MOTHERS: A COMPARISON STUDY

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Abstract

Infant-directed speech uttered by fathers and mothers was compared. Vocal interaction between 9 pairs of parents and their infant was recorded individually in natural setting. Utterances were classified in terms of function, syntactic forms, and referents utilizing written transcripts. There were significant differences in the use of function, syntactic forms, and referents between fathers' and mothers' speech. Fathers tended to use utterances to attract the infants' attention and elicit infants' vocalization more often than mothers did. On the other hand, mothers produced utterances expressing positive affection, imitating infant's vocalization, and involving play with vocalization more than fathers did. It is suggested that the difference in functional use of infant-directed speech between fathers and mothers reflects the difference in their attitude to interacting with the infants.

Key words : Infant-directed speech, Parent-infant vocal interaction, Infant, Prelinguistic period

Introduction

When caregivers speak to infants, they use characteristic speech: a higher pitch, greater pitch range, slower tempo, longer pauses, shorter phrases, higher exaggerated pitch contour, and more prosodic repetition compared with their speech to an adult (Bergeson & Trehub, 1999; Fernald & Simon, 1984; Niwano & Sugai, 2002a, 2002b, 2002c). However, almost all reported studies on caregivers' infant-directed speech have focused on the mother's speech. Only a few attempts have so far been made to investigate the father's infant-directed speech.

Niwano and Sugai (in press-b) reported that fathers also use higher pitch, exaggerated pitch excursion, and shorter utterance duration when they speak to their infants than when they speak to adults. These acoustical features of fathers' infant-directed speech are very similar to mothers' infant-directed speech. This brings us to the question of whether the function of infant-directed speech is similar or different in mothers and fathers. It has been reported that mothers' infant-directed speech plays the roles of maintaining infants' attention and expressing positive affection (Bergeson & Trehub, 1999; Trainor, 1996; Trainor, Clark, Huntley, & Adams, 1997). Niwano and Sugai (2002c) found that Japanese mothers use a falling intonation contour more often than a rising or flat intonation contour when they speak to 3-month-old infants. Mothers use specific intonation contours for specific meaning (Niwano & Sugai, in press-a). A falling contour is used for soothing when American or German mothers communicate with their infants (Fernald,

1989; Papousek, 1992). Shimoda, Argyle, and Riccibitti (1978) noted that Japanese mothers use infant-directed speech to calm infants. Therefore, it seems that mothers tend to use infant-directed speech to soothe.

Niwano and Sugai (in press-b) reported that the infant's rate of vocal response to mothers and to fathers differed even if the acoustic features of the father's and mother's infant-directed speech were similar. It is likely that there is a difference not in acoustic features but in speech function between fathers' and mothers' infant-directed speech.

The purpose of the present study was to compare the utterance function, syntactic forms, and referents between mothers' and fathers' infant-directed speech utilizing written transcripts. It was hypothesized that the function, form, and reference of the fathers' speech would differ from that of the mothers.

Method

Participants

Nine Japanese mothers, their husbands, and their infants composed the final sample. The infants were 4 firstborn males and 5 firstborn females, born in 1999-2000, and 3-7 months old at the time data were collected. All were healthy with no history of hearing disorder or infection. All of the mothers were full-time housewives (M age at child birth = 29.4 years, SD = 3.57 years), and all of the fathers were full-time businessmen (M age at child birth = 32.0 years, SD = 3.35 years), primarily drawn from the middle socioeconomic classes and native-born citizens of Japan. Table 1 shows the participants' ages. The data were collected during home visits in a natural setting. A further additional 3 parent-infant dyads failed to complete the recording because of the infants' excessive crying (2) or few utterances (1).

Table 1 Participants' ages

Participant	Infants		Participant	
	Sex	Age (Mo)	Father's age (Yr)	Mother's age (Yr)
A	F	3	30	24
B	F	3	28	26
C	M	3	31	28
D	M	3	35	32
E	F	5	29	31
F	M	5	37	29
G	F	7	33	33
H	F	7	36	35
I	M	7	29	27

Procedure

Utterances during the mother-infant and father-infant interactions were tape-recorded. In order to compare the function of the parents' infant-directed speech, every utterance was written as transcripts. The parent was instructed to talk to her/his infant as she/he normally did at home without touching or rocking the infant. Each recording session lasted 15 minutes. Both subjects were seated in chairs or on the floor facing each other. I then sampled 3 consecutive minutes, selecting them so that many vocal interactions between the subjects were included. All meaningful communicative vocalizations were considered as words, e.g., back channels, such as *ooh*, *aah*, and *mmm*. Nonverbal sounds such as kisses, and laughter were excluded.

Coding

The fathers' and the mothers' utterances were scored in terms of three speech parameters: function, syntactic form and referent. The categories were decided according to Niwano (2003) and observation from the subjects' utterances in the present study. The categories and speech samples are summarized in Table 2, 3 and 4, following Morikawa, Shand, and Kosawa (1988). The author of the present study and a native speaker of Japanese who did not know the hypothesis of the present study coded the parents' utterances as to function, form, and referential category. The two coders independently coded 20 % of the speech samples selected randomly. Intercoder agreement for each parameter of the speech samples was greater than 90 %, so the rest of the samples were shared between the two coders and analyzed.

Table 2 Function category for utterance classification

Function	Code	Definition/Example (words written in italics are Japanese)
Attracting infant attention	AAT	Attract infant's attention e.g. Look at me. <i>Kocchi muite.</i>
Eliciting infant vocalization	ELV	Elicit infant's vocal response. e.g. What happened? <i>Doshitano.</i>
Positive affection	PAF	Show positive affect toward infant. e.g. Great! <i>Sugoine. / You sre so cute. Kawaiine.</i>
Negative affection	NAF	Show negative affect e.g. Don't do that. <i>Dame desuyo.</i>
Information	INF	Give information e.g. It's sunny day. <i>Orenki ga iidesuyo.</i>
Imitating infant vocalization	IMI	Imitate infant's utterance. e.g. Au-au. (Infant's babbling sound.)
Playing with vocalization	PLA	Play with mimetic words or meaningless words. e.g. Peep, peep. <i>Piyo, piyo.</i>
Function unclear	UNC	Affect neutral utterance without apparent intention of eliciting infant's attention or utterance.

Table 3 Form categories for utterance classification

Form	Code	Example (words written in italics are Japanese)
Question	QUE	Do you want to go out? <i>Osoto e ikitaino.</i>
Imperative	IMP	Say hello. <i>kommichiwatte itene.</i>
Statement	STA	This is a cookie. <i>Kore wa kukkii desuyo.</i>
Greeting	GRE	Hello. <i>Konnichiwa.</i>
Back channel	BCH	Uh-huh. <i>Un, so.</i>
Incomplete	INC	Oh, my goodness. <i>Arara.</i>
Non-linguistic vocalization	NLV	Peep, peep. <i>Piyo, piyo.</i>

Table 4 Referent categories for utterance classification

Referent	Code	Example (words written in italics are Japanese)
Infant	INFA	You want to go out, don't you? <i>Osoto ni ikitainone.</i>
Parent	PAR	I want to go shopping. <i>Okaasan wa okaimono ni ikitaino.</i>
Infant and parent	BOT	We are going for a walk. <i>Osampo ni ikitasuyo.</i>
Environment (object, person, etc)	ENV	Here's your doll. <i>Oningyo ga aruyo.</i>
No referent	NRE	Oh, my goodness. <i>Arara.</i>

Results

Function

All the sampled utterances were coded according to each function. Figure 1 shows the difference in the rate of appearance of each utterance function between the fathers and mothers. There was a significant difference in the rate of appearance of each utterance function ($\chi^2 = 45.3$, $df = 7$, $p < 0.001$). In the fathers' speech, the frequency of appearance of utterances attracting infant attention (AAT) was 18.7 %, against 6.4 % in the mothers' speech. The fathers produced speech with the aim of eliciting the infant's vocalization (ELV) 32.7 % of the time, while the mothers did 14.2 % of the time. The percentage of functionally unclear speech (UNC) was 9.4 % in fathers' utterances, and 2.0 % in mothers' utterances. On the other hand, the mothers produced utterances expressing positive affection (PAF) 24.1 % of the time, imitating infant's vocalization (IMI) 28.3 % of the time, and play with vocalization (PLA) 15.2 % of the time, while the fathers did 12.3 %, 6.9 %, and 3.2 % of the time, respectively.

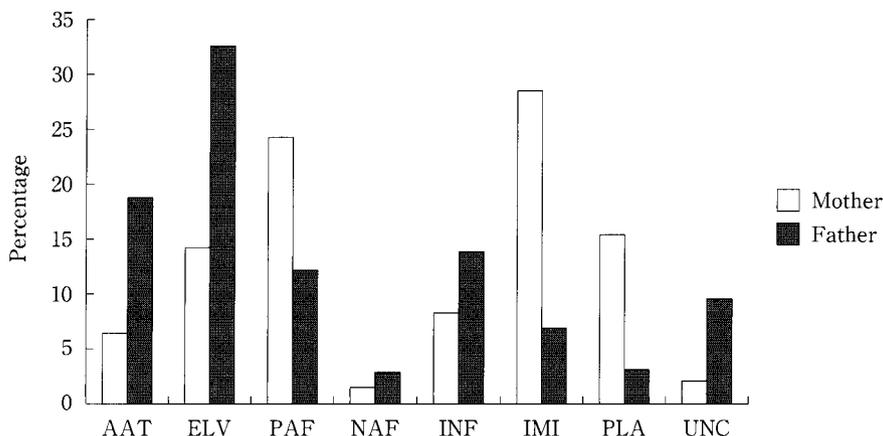


FIG. 1. Difference in rate of appearance of each function category in infant-directed speech of fathers and mothers.

Syntactic form

As seen in Figure 2, the rate of appearance of the syntactic form of the parents' infant-directed speech also differed significantly between fathers and mothers ($\chi^2 = 36.7$, $df = 6$, $p < 0.001$). Questions (QUE) appeared in 8.4 % of the fathers' infant-directed speech, imperatives (IMP) in 10.8 %, and greetings (GRE) in 31.6 %, while these forms appeared in 1.7 %, 3.4 %, and 11.6 %, respectively, of the mothers' infant-directed speech. Greetings appeared the most often in fathers' speech, such as saying *hello* and calling the infant's name. The fathers tended to use QUE, IMP, and GRE as functions for attracting infant attention (AAT) and eliciting infant's vocalization (ELV). On the other hand, the mothers tended to use back channel (BCH) more than the fathers. The percentage of back channel among the mothers' utterances was 27.6 %, but 5.8 % in the fathers' utterances. The mothers produced more non-linguistic vocalizations (NLV) (32.3 %) than the fathers did (18.5 %).

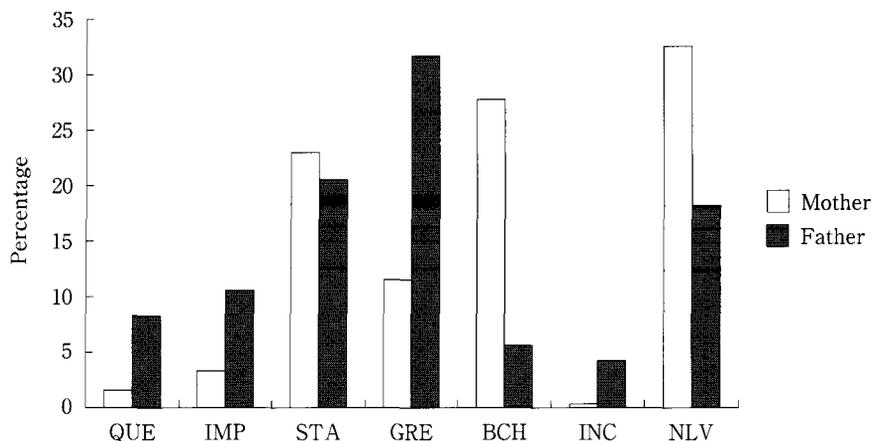


FIG. 2. Difference in rate of appearance of each syntactic form category in infant-directed speech of fathers and mothers.

Referent

Comparing the reference between fathers' and mothers' infant-directed speech, it was found that parent (PAR) and environment (ENV) appeared more often in the fathers' than the mothers' infant-directed speech, as Figure 3 shows. There was a significant difference in the appearance of referent between mothers' and fathers' infant directed speech ($\chi^2 = 14.6$, $df = 5$, $p < 0.01$). Both fathers and mothers tended to refer to the infants often (37.1 % in the fathers' utterances, and 43.4 % in the mothers' utterances). The fathers referred to themselves in 12.9 % of utterances and the mothers did in 3.4 %. From the observation of the fathers' speech, it was noticed that fathers often referred themselves when they spoke to their infants, in phrases such as 'I am your father', or 'I am going to play with you'. On the other hand, when the mothers spoke to their infants, they tended to refer to the infants more often than did the fathers, e.g. 'you (the infant) want to go out', or to speak for the infants, e.g. 'I (the infant) am hungry'.

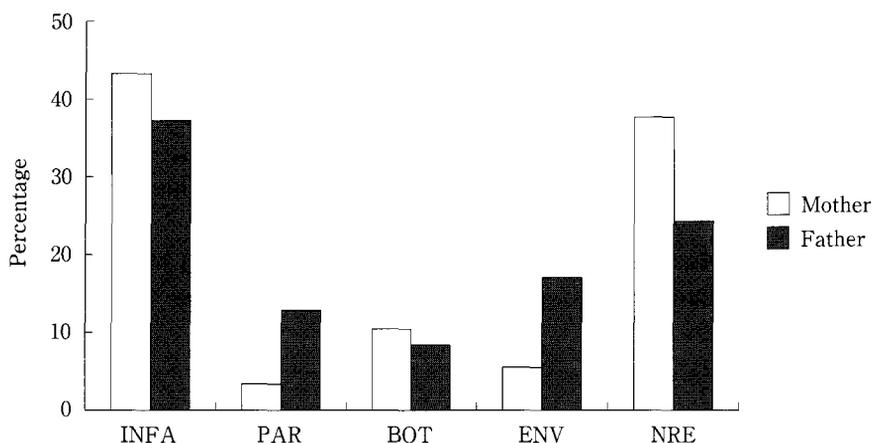


FIG. 3. Difference in rate of appearance of each referent category in infant-directed speech of fathers and mothers.

Discussion

The present study provides support for the hypothesis that there is a significant difference in the quality of father-infant and mother-infant vocal interaction. The results in the present study showed that the function of infant-directed speech is different between mothers and fathers.

When the mothers speak to the infants, positive affection (PAF) and imitating infant vocalization (IMI) appeared in the speech more often than in the fathers' speech. The mothers used back channel more than the fathers and tended to refer to their infants. One possibility to explain the result would be that mothers try to elicit infants' vocalization or communicative behavior. The mothers are patient in waiting for the infants' response or initiation of interaction. Once infants start to utter, mothers tend to maintain the infants' utterances with back channel. Furthermore, the mothers produced play with vocalization more than the fathers did. It seems that the mothers' aim is not to elicit the infants' vocal response but their spontaneous utterance or other communicative behavior.

Caudill (1972) reported that Japanese mothers produce infant-directed speech for the purpose of soothing when the infants are crying or unhappy. Our observations also indicated that mothers' attitudes while interacting with infants were passive. The mothers spend almost all day with their infants and have close interactions with them. It may be that it is important for the mother not to attract the infant's attention but also to show an attitude of acceptance of the infant's vocalization, and to show affection for the infant. This may be one reason why mothers use a lot of back channel.

On the other hand, when the fathers spoke to the infants, they used questions and greeting words more than the mothers did. It seems that fathers believe using questions and greeting words would play the role of eliciting the infants' vocal response and attracting their attention during times of interaction. They referred to themselves more than to the infants. One possibility is that this reflects the fathers' desire to lead interactions with the infant. Another possibility is that the fathers are impatient in waiting for the infants' response and they try to elicit interactive behavior. Fathers might use infant-directed speech as a strategy for the regulation of arousal and attention in infants. Moreover, they might try to make the infants aware of their existence because they spend less time with the infants than the mothers do.

In conclusion, even though there are many similarities in acoustic characteristics between mothers' and fathers' infant-directed speech, the functional use of infant-directed speech is different, and it is suggested that the difference between fathers' and mothers' infant-directed speech reflects the difference in their attitudes while interacting with the infants.

The present study was a pilot study with a small sample. A larger sample of mothers' and fathers' infant-directed speech when they are interacting with infants is needed to confirm the results.

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