J. Child Lang. 17 (1990), 279–294. Printed in Great Britain

Maternal speech to three-month-old infants in the United States and Japan*

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(*Received* 2 *August* 1988. *Revised* 1 *March* 1989)

ABSTRACT

An American-Japanese comparison of maternal speech to 3-month-old infants is presented. Mother–infant dyads were videotaped in the laboratory, and the maternal speech was analysed by function and syntactic form. US mothers were more information-oriented than were Japanese mothers; they also used more question forms, especially *yes/no* questions. Japanese mothers were affect-oriented, and they used more nonsense, onomatopoeic sounds, baby talk, and babies' names. The differences between countries in maternal speech addressed to 3-month-olds appear to reflect characteristic culture-specific communicative styles as well as beliefs and values related to childrearing.

INTRODUCTION

Maternal speech to prelinguistic infants may serve dual purposes, as input for language acquisition and as socialization for culturally appropriate

[*] Portions of this paper were presented at the Southeastern Conference on Human Development, 1988. The research was supported by a Visiting Fellowship at the National Institute of Child Health and Human Development to the first author. It was also funded by a Fulbright Senior Research Fellowship awarded to the second author, by the Department of Educational Psychology of Nagoya University, and by a Hatch Act grant from the Purdue University Agricultural Experiment Station. The authors wish to thank the coders, assistants, and subjects who participated in this study. We are grateful to E. Nwokah for her assistance in coding maternal speech. We thank M. Bornstein for comments. Address for correspondence: Sueko Toda, NIH, Building 31, Room B2–B15, 9000 Rockville Pike, Bethesda, MD 20892, USA.

communication. Mothers establish conversations with infants as potential communication partners and interpret as meaningful infant behaviours such as smiling, gazing, or vocalizing (Blount, 1972; Snow, Blauw & Roosmalen, 1979). Infants take an active role and regulate their mothers' behaviour as well (Murray & Trevarthen, 1986). Through mother–infant communication, infants are socialized, integrating maternal behaviour and speech into their development. However, it is not clear in what ways infants select maternal behaviour and speech for the acquisition of linguistic knowledge and communicative skill (Blount, 1977).

In most cultures, the maternal speech register is adapted to the development of language acquisition in the infant. For example, when they start using single words, children select high pitch and repetition in maternal speech (Newport, Gleitman & Gleitman, 1977; Sachs, 1977). However, the maternal speech register may also be adapted to the communicative code of a culture. For example, the adult–adult Japanese communicative style is intuitive and indirect emphasizing empathy and conformity. Japanese mothers use this kind of communicative style to their children in language socialization from early childhood. American communicative style is direct, emphasizing individual expression (Clancy, 1986). From this perspective, maternal speech to prelinguistic infants needs to be examined in a range of environments to understand how it is affected by different cultures.

The purposes of the present study are to investigate and compare the characteristics of maternal speech to 3-month-olds in the US and in Japan. The US and Japan are good candidates for a comparison of the socialization of communication because both countries are similar in level of industrialization, per capita income, and education level. In both countries the mother is almost invariably the primary caregiver, and caregiving is child-centred (Caudill, 1973). However, there are major differences in history, culture, beliefs, and values of childrearing. In Japan, for example, although the life style has been modernized, traditional beliefs and values of childrearing are still retained (Azuma, 1986; Kojima, 1986*a*, *b*). These cultural differences might affect maternal communicative styles to children.

Previous research in mother–infant interaction found that US mothers have a tendency to respond to and stimulate infants' positive vocalization, whereas Japanese mothers showed less vocalization and physically contacted their infants more (Caudill & Weinstein, 1969; Shand & Kosawa, 1982; Sengoku, 1983; Otaki, 1986). Japanese mothers also were more likely to respond to infants' negative vocalizations. Fogel, Toda & Kawai (1988) found that US mothers were more likely to vocalize contingently in response to changes in infant behaviour, whereas Japanese mothers used non-vocal modes such as touching and posture shifting as contingent responses. US mothers were also more likely to respond contingently to infant positive vocalization, even though the overall frequency and duration of maternal

vocalization did not differ between the two countries. These findings in behavioural research suggest that Japanese mothers show a non-verbal communicative style, which plays an important role in Japanese culture, whereas US mothers may emphasize a more vocal communicative mode to infants (Morsbach, 1973). Furthermore, in a study of disciplinary styles, Japanese mothers used more feeling-oriented appeals in negotiation with children, whereas the US mothers were more likely to appeal to their authority as mothers (Conroy, Hess, Azuma & Kashiwagi, 1980). The cultural differences in communicative styles affect not only mothers' behaviour, but also mothers' speech to the young infant.

In analysing the content of mothers' speech, Morikawa, Shand & Kosawa (1988) found cultural differences between Japan and the US. US mothers used negative or prohibiting utterances when infants were looking at the mother. In contrast, Japanese mothers did so when infants were looking away from the mother. US mothers talked about a variety of things outside the context of their direct interaction with the infants, whereas Japanese mothers were more indirect in action-eliciting situations by not referring explicitly to infants' actions. Furthermore, Japanese mothers produced more non-linguistic utterances and grammatically incomplete utterances in contrast to US mothers, who used grammatically complete utterances.

In contrast to the fairly extensive research on mothers' behaviour in mother–infant interaction, a cross-linguistic comparison of the structure and the content of maternal speech to prelinguistic infants has not been systematically studied with reference to the US and Japan except by Morikawa. Our study was geared in part to fill this gap in understanding language acquisition and socialization.

The characteristics of maternal speech to infants found in the US include unclear, short, simple, baby-centred utterances, repetition, calling by name, frequent use of the interrogative form, and changes in speech registers with infant development (Phillips, 1973; Newport, Gleitman & Gleitman, 1977; Snow, 1977*a*, *b*; Kaye, 1980; Morikawa *et al.*, 1988). Maternal speech to young infants is more complicated than that to older infants. When mothers talk to prelinguistic infants, their speech is more conversational than it is to infants who are using single words. At that stage, mothers try to teach children, so their speech becomes slow and simplified.

So called 'baby talk' or 'motherese' is a specific conversational register characterized by simplified structure to help children learning language, and by affectionate expression to the infant (Chew, 1969; Brown, 1977; Ferguson, 1977). The motherese register has been studied in relation to mother's tone, pitch (Papousek, Papousek & Bornstein, 1985), and repetition (Kaye, 1980). In the present study baby talk (BT) is defined as a specific register of language felt to be appropriate for use with young children, in contrast to use of adult words (Ferguson, 1977).

Example:

US stomach (adult speech) → tummy (BT)
Japan onaka 'stomach' (adult speech) → ponpo 'tummy' (BT)

It has been hypothesized that in the West BT is used in maternal speech to get the infant's attention in asymmetrical interaction (Snow, 1977*b*; Morikawa *et al.* 1988). In Japan, BT is used to distinguish children from adults (Fisher, 1970; Clancy, 1986). BT in the two countries has not been compared in previous research. However, if Japanese mothers emphasize this cultural value, they might use BT more than US mothers.

Our goals were to observe and understand the relationship between infants' and mothers' behaviour and maternal speech. The present study aimed to compare and contrast the characteristics of maternal speech to prelinguistic infants in the two countries.

At around $2\frac{1}{2}$ months, infants show an increase in smiling, positive vocalization, and a decrease in negative vocalization (Brazelton, Koslowski & Main, 1974; Keller & Scholmerich, 1987), signalling the onset of active social behaviour. They attend to maternal speech. At 3 or 4 months, each interlocutor contributes to the vocal interaction, and vocalization also elicits the partner's attention. The vocal conversation between mother and infant acquires the characteristics of turn-taking (Stevenson, Ver Hoeve, Roach & Leavitt, 1986). Therefore, in this study 3-month-old infants were observed to compare the characteristics of maternal speech in the US and Japan in order to understand the bases of language socialization and its development. Does Japanese mothers' speech show similar characteristics to American mothers' speech? On the basis of past research, we hypothesized that maternal speech to 3-month-olds would be different in content and form in the two countries (Caudill & Weinstein, 1969; Morsbach, 1973; Clancy, 1986; Fogel *et al.* 1988). We also hypothesized that Japanese mothers would be more affect-oriented and would use BT more than US mothers.

METHOD

Subjects

In Japan, 36 mother–infant dyads were recruited by oral request from the waiting room of a community health clinic in Nagoya, Japan, where the children were brought for their normal three-month check-up. The first 36 subjects to volunteer were observed in this study. However, only 34 dyads (16 male infants, 18 female infants) were used for the analysis because one mother used a toy during mother–infant face-to-face interaction, and a second used only nonsense sounds. Observation were conducted in a room in the clinic adjacent to the waiting room.

In the US, 28 mother–infant dyads (13 male infants, 15 female infants)

were recruited by telephone from the birth announcements in the local newspaper in Lafayette and West Lafyette, Indiana. Subjects were all Caucasian-American and reflected the ethnic make-up of the community. Observations were conducted in a laboratory playroom at Purdue University. In both countries, all the infants had normal, full-term births with no complications. No teenage or lower-income mothers were included in the sample.

Procedure

The procedures were identical in both countries. At the time of recruitment and during the briefing before the observation, mothers were told that we were interested in the expressive and communicative abilities of young infants during social play. They were not told that the data would be used for cross-cultural comparison. They were asked to come to the observation room and to be videotaped during a free-play session with their infants. In the US, the instructions were, 'Please play with your baby as you might do at home.' These instructions were translated into Japanese as, 'Ouchi de yatte iru noto onaji yoo ni aite shite kudasai.' The communicative style was left to the mother. Toys were not provided, and the mothers were asked not to use any toys or pacifiers during the videotaping. Therefore, mothers could devote all of their time to conversation with the infants.

The observation room contained an infant seat mounted on a table at a height that allowed face-to-face interaction when the mother was seated. The specially designed infant seat, the same in both countries, provides support for the head, back, and rump, leaving the arms and legs free to move in all directions. Two video cameras were used: one focused on the infant's face and hands, the other on the mother's upper body and face. The two video signals were mixed using a special-effects generator, and a digital clock accurate to 0·01 sec was included in the composite video display.

Each mother was asked to interact with her baby for two minutes. Two minutes is a short amount of time compared to the two- to five-hour-long home observations used in previous studies of mother–infant interaction in Japan and the US (Caudill & Weinstein, 1969; Shand & Kosawa, 1985; Bornstein, Miyake & Tamis-Lemonda, 1986). The reason for selecting two minutes as a sampling time is that babies of this age can rarely sustain intense face-to-face interaction for more, and mothers find it difficult to continue for much longer with such young infants.

The measurement of maternal speech

The mothers' utterances were measured by three approaches: functional, syntactic form and BT.

TABLE 1. *Categories of maternal communication*

I A. Information-salient categories (fully propositional sentences, acceptable in normal adult conversations)

DIRECT

infant's actions: to attend to something or to do something, e.g. 'Talk to me.' (US) 'Ohanashi shite.' (Japan)

infant's feelings: to feel something, e.g. 'Do not be angry at me.' (US) 'Okonnaide.' (Japan)

INTERPRET

infant's actions: in meaningful or intentional terms or as a desire for action, e.g. 'You want to go home.' (US)
'Ouch kaeritai none.' (Japan)

infant's feelings: in terms of affective states, e.g. 'You like to have some milk.' (US) 'Oppai hoshii deshoo.' (Japan)

QUESTION

infant's actions: in terms of what the infant's intentions may be, e.g. 'What are you doing?' (US)
'Nani shiteruno?' (Japan)

infant's feelings: in terms of affective states, e.g. 'Are you hungry?' (US) 'Onaka suita? (Japan)

external environment: asking infant about other things external to infant, e.g. 'Is this a funny chair?' (US)
'Kono isu okashii ne?' (Japan)

vague questions: not clear what mother asks, e.g. 'hum?' (US) 'n?' (Japan)

REPORT

infant's actions: describing behaviour without inference, e.g. 'You've got my finger.' (US)
'Mamano ubi namete.' (Japan)

mother's behaviour: direct descriptions of observables, e.g. 'I'll give you some milk, later.' (US)
'Atode oppai ageru karane.' (Japan)

external environment: describing other things, e.g. 'This is a funny chair.' (US)
'Kono isu okashii ne.' (Japan)

ANSWER

mother answers herself, e.g. 'Yes. Sure. Yes, you are.' (US)
'Un. Soo nano.' (Japan)

DIDACTIC

saying alphabet or counting numbers in terms of teaching, e.g. 'A B C D.' 'One two three.' (US)
'A I U E O.' 'Ichi ni san.' (Japan)

LABEL

speaking one word, e.g. 'Hiccups' (US).
'Shyakkuri' (Japan).

OTHER - words that do not fit into other categories

I B. Affect-salient categories (general non-propositional, idiomatic, or meaningless outside context).

ENCOURAGES

positive affect, reassuring, comforting, encouraging, e.g. 'You are a good boy.' 'It's all right.' 'Don't cry.' (US) 'Iiko iiko.' 'Nakanaide.' (Japan)

CONVENTIONS

using conventional phrases, e.g. 'Thank you.' 'Well.' 'Yeah.' 'Really?' 'Oops.' 'Right?' (US)
'Arigato.' 'Aaa.' 'Honto?' 'Ara.' (Japan)

TABLE 1. (*cont.*)

DISCOURAGE
negative affect, prohibiting, discouraging. e.g. 'You are a silly girl.' 'No, you cannot.' (US)
'Bakane.' 'Dekinaino.' (Japan)

NONSENSE
utterances unacceptable in adult speech and relying wholly on context for interpretation., e.g. 'Goo goo.' 'Ah-boo'

GREETING
vocatives or attentionals, e.g. 'Hi.' 'Hello.' (US)
'Haai.' 'Konnichiwa.' (Japan)

CALLING BY NAME
calling the baby's name, terms of endearment, 'Honey,' 'sweetheart' (US)
'Chan' (Japan)

RECITES
models infant's sounds, e.g. 'This little piggy went to market.'

GAME
playing with the baby, e.g. 'Peek a boo. I'm gonna get you.' (US)
'Inai inai baa.' (Japan)

SONG
singing a song.

ONOMATOPOEIC
sounds that imitate what they denote, e.g. 'Tick tock' (US).
'Chikku takku' (Japan)

II. Syntactic forms

INTERROGATIVE	(*a*) *Wh*-question	'What are you looking at?' (US)	
		'Nani mite iru no?' (Japan)	
	(*b*) *yes/no* question	'Are you hungry?' (US)	
		'Onaka suita?' (Japan)	

IMPERATIVE
'Talk to me.' (US)
'Ohanashi shite.' (Japan)

DECLARATIVE
'You fall down.' (US)
'Okkochru yo.' (Japan)

III. Baby talk

Functional approach. The measurement of maternal speech to young infants has been studied by a number of investigators focusing on function, prosody, communication with infants, and infants' attention to utterances (Folger & Chapman, 1978; Stern, Spieker & MacKain, 1982; Della Corte, Benedict & Klein, 1983; Penman, Cross, Milgrom-Friedman & Meares, 1983; Morikawa *et al.* 1988). In order to compare our results with studies of maternal speech in different countries, a functional approach was employed. A variety of functional category systems have been used in the analysis of mother–child interaction (see Rondal, 1985). Penman *et al.* (1983) (following on Brown's (1977) discussion) categorized maternal speech into two modes: INFORMATION-SALIENT (fully propositional sentences that are not stereotyped

expressions and that are acceptable in normal adult conversations) and AFFECT-SALIENT (expressive and affective, and generally non-propositional, idiomatic, or meaningless content). We broadly followed this classification. We hypothesized that Japanese mothers would speak to their infants in a more affect-oriented way than US mothers (Conroy *et al.* 1980). The categories are mutually exclusive. As seen in Table 1, eight categories are recognized as information-salient, and 10 categories as affect-salient.

Syntactic form. Some studies have found that mothers use question forms quite frequently to prelinguistic infants, and that the use of questions is correlated with the development of child language (Newport *et al.* 1977; Snow, 1977*b*). Therefore, we also analysed maternal speech by syntactic form: interrogative (*yes/no* question, *Wh*-question), imperative, declarative. In coding, one-word phatic utterances (e.g. 'hi') or nonsense sounds (e.g. 'ba') were excluded from syntax categorization.

Baby talk. The frequency of BT was counted separately. In coding Japanese BT, the word 'chan' (used when the adult calls the child) was excluded from the BT category, but was included in the category 'calling by name'.

Coding and reliability

Coding was conducted by students native to each country. The coder transcribed every maternal word from the videotape of each session. Each utterance was scored into the categories listed in Table 1. Ten percent of subjects were checked by both US and Japanese investigators to compute reliability. The reliability by percentage of agreements was 80% (range 72–97% for function, 80–89% for syntactic form) and 98% for BT. 'Didactic', 'Label' and 'Other' in Information-salient were combined into 'Other' because of low frequencies in individual categories.

RESULTS

We computed the mean frequencies of each functional category, syntactic form, and BT. To compare the two countries, an ANOVA was carried out. To control for a family-wide error rate of 0·05, we required individual ANOVA significance levels of 0·01. (Woods, Fletcher & Hughes, 1986).

Table 2 summarizes the mean frequencies for each function category in the US and Japan. There were several similarities between the two countries. Both the US and Japanese mothers used question forms most frequently among information-salient categories, and used conventions and nonsense sounds most frequently among affect-salient categories. However, we found different communicative styles between Japan and the US. The US mothers

tended to be information-oriented more than were Japanese mothers (58% vs. 38%). 'Direct' and 'Question' were used significantly more by the US mothers. The US mothers also asked questions more frequently than the Japanese mothers.

In comparison with US mothers, Japanese mothers were more affect-oriented (62% vs. 42%). Japanese mothers used 'Nonsense', 'Onomatopoeic' sound, and 'Calling by name' more frequently than the US mothers. The results showed that US mothers talked to infants using grammatically complete or incomplete utterances (using more information-oriented language), whereas Japanese mothers rarely talked to their infants in grammatically complete utterances. Instead, they used short and simple utterances such as nonsense or onomatopoeic sounds, or calling by name.

TABLE 2. *Mean frequencies of different categories of maternal speech in the US and Japan*

	Country				
	US		Japan		
Category	Mean	(S.D.)	Mean	(S.D.)	*F*
Information-salient					
Direct	6·4	(5·83)	3·1	(3·50)	7·61**
Interprets	1·7	(1·65)	2·1	(2·34)	0·43
Question	15·2	(4·91)	9·9	(6·60)	12·37***
Report	6.0	(4·39)	5·7	(4·15)	0·09
Answer	3·1	(3·33)	1·9	(3·38)	1·74
Other	1·5	(4·02)	2·9	(2·92)	2·58
Subtotal	33·9	(58%)	25·6	(38%)	8·01**
Affect-salient					
Encourages	1·7	(2·65)	1·7	(3·26)	0·00
Conventions	8·0	(4·87)	7·6	(5·43)	0·08
Discourages	1·6	(1·85)	1·1	(1·56)	1·61
Greetings	4·1	(5·12)	7·5	(9·31)	2·92
Calling by name	2·0	(2·76)	5·9	(6·50)	8·41**
Recites, songs and games	0·7	(1·46)	0·8	(2·01)	0·03
Nonsense	5·9	(7·07)	13·9	(11·01)	11·07**
Onomatopoeics	0·6	(1·64)	4·1	(4·72)	14·59***
Subtotal	24·6	(42%)	42·5	(62%)	27·47***

**$p \leq 0.01$; ***$p \leq 0.001$.

Example in the American data:
M: Talk to me. (Direct)
Are you hungry? (Question)
Yes, you are. (Answer)

Example in the Japanese data:

M: Ba ba ba ba ba. (Nonsense)
Pon pon pon (Tapping infant's hands). (Onomatopoeic)
Ayu *chan, otete batchii deshu* ne? (Calling the baby's name and using BT)
'Ayu [name], your hands are dirty, aren't they?'

Table 3 summarizes the mean frequencies of information-salient categories grouped by topics of maternal speech. Mothers in both countries talked about infant actions most frequently. 'Other' (meaning the topic is not clear) also occurred frequently, in accord with Morikawa *et al*'s (1988) study. The use of unclear utterances may be one of the characteristics of maternal speech to three-month-olds. Further study is required to confirm this result. The US mothers talked significantly more about the infant's actions than did the Japanese mothers.

TABLE 3. *Mean frequencies of information-salient categories grouped by the topic of maternal speech in the US and Japan*

	Country				
	US		Japan		
Category	Mean	(S.D.)	Mean	(S.D.)	*F*
Infant actions	17·7	(8·44)	11·0	(7·57)	10·87**
Infant feelings	4·0	(4·01)	4·9	(4·21)	0·69
External environment	2·2	(3·76)	1·3	(1·74)	1·52
Mother's behaviour	3·0	(3·36)	1·3	(2·82)	4·73
Other	6·9	(5·81)	7·1	(5·52)	0·01

** $p \leqslant 0{\cdot}01$.

Table 4 summarizes the mean frequencies of syntactic forms. There were significant differences between cultures in the use of the question form among information-salient categories as seen in Table 2. It appears that US mothers use the *yes/no* question form more frequently than the *wh* question form, and more frequently than Japanese mothers. US mothers also used the Imperative form more than Japanese mothers. There were no significant differences between the two countries in frequencies of Declarative forms. The more frequent use of syntactic forms in US mothers than Japanese mothers highlights the fact that US mothers tended to talk to their infants with grammatically complete or incomplete utterances.

The mean frequency of BT showed significant differences between the US and Japan (Table 5). Japanese mothers used BT in their interactions with their infants more often than did US mothers. The BT expressions used most often by the US mothers were 'mama' and 'tummy'. The Japanese

TABLE 4. *Mean frequencies of syntactic forms*

	Country				
	US		Japan		
Category	Mean	(S.D.)	Mean	(S.D.)	*F*
Wh-question	4·2	(3·82)	3·7	(3·32)	0·24
Yes/no question	9·0	(4·07)	4·0	(3·16)	29·22***
Imperative	6·6	(5·76)	3·1	(3·67)	8·56**
Declarative	11·6	(7·48)	9·8	(6·54)	1·00

** $p \leq 0{\cdot}01$; *** $p \leq 0{\cdot}001$.

mothers used a greater variety of BT (see Appendix). Thirty-eight percent of Japanese BT consisted of phonological alterations; the remainder involved a change of lexical items.

TABLE 5. *Mean frequencies of baby talk in the US and Japan*

	Mean	(S.D.)	*F*
US	1·2	(2·14)	10·71**
Japan	6·1	(7·64)	

** $p \leq 0{\cdot}01$.

DISCUSSION

The present study compared the style and content of speech by American and Japanese mothers to their 3-month-olds. Mothers in the two cultures showed some similarity in frequency of functional categories of speech: interrogative forms, unclear utterances, and nonsense utterances. Other research has found similar results (Newport *et al.* 1977; Snow, 1977*b*; Morikawa *et al.* 1988), and these characteristics of maternal speech to 3-month-olds may be common across different cultures.

However, there were significant differences between the two cultures, as expected. First, the US mothers' communication was more information-salient, and used grammatically complete or incomplete utterances more frequently than did the Japanese mothers' communication. US mothers used the *yes/no* question form more than the *Wh*-question form and more frequently than did the Japanese mothers. We found that US mothers favoured information over affect-salient categories, as Penman *et al.* (1983) found in Australian mothers with their 3-month-olds. It appears that US mothers talked about the young infants' actions quite often. In contrast,

Japanese mothers used nonsense, onomatopoeic utterances, calling by name and BT more than the US mothers.

Second, as hypothesized, Japanese mothers used BT more than US mothers. Why might this be? Fisher (1970) and Clancy (1986) suggest that Japanese mothers try to distinguish children from adults in order to teach age and status differences from an early age. In the Japanese language, the conversational form differs according to the sex or status of the speakers in the family or society, and speech in turn affirms these differences in Japanese culture (Hakuta, 1986; Kuno, 1986). The use of BT may also reflect a mother's expression of affection, by identifying with the baby through baby talk (Fisher, 1970). That the speaker thinks of the listener's situation is important in Japanese conversation. However, we do not know whether Japanese mothers' more frequent use of BT affects children's language acquisition and comprehension.

Differences in maternal speech between cultures may also reflect more general beliefs and values in the two cultures. American mothers seem to express their authority (Conroy *et al.* 1980) by the use of the imperative form (e.g. 'Talk to me'). The evidence that US mothers use grammatically complete or incomplete utterances, more like adult–adult conversation, may reflect the fact that US mothers emphasize direct individual expression and that they teach independence to children from an early age (Clancy, 1986). The Japanese mother's goal seems to be to empathize with the infant's needs, rather than to show authority as a mother. The present study showed that Japanese mothers did not use grammatically complete utterances as much as US mothers. Instead, they played with sounds using nonsense, onomatopoeic sounds, songs, games, or BT.

Simplified maternal speech such as nonsense and BT may capture infants' attention (Snow, 1977; Morikawa *et al.* 1988). If this is true, is Japanese mothers' speech likely to elicit and maintain attention from the infant more frequently than US mothers'? Although some data (Bornstein, Azuma, Tamis-Lemonda & Ogino, 1988) show that Japanese mothers verbally encourage infants to look at them more frequently than US mothers, there is no difference in the amount and temporal pattern of 'gaze at mother' between the countries (Fogel *et al.* 1988). In an analysis of the non-verbal behaviour of the same subjects who participated in the present study, no differences were found in the frequency and duration of gaze at mother. It might be that different communicative styles in the US and Japan serve similar attention-getting functions in maternal speech.

Our results suggest that a number of culturally different communicative styles in maternal speech may be equally successful in getting attention from the infant. That is, US mothers may use phonological elements such as high-pitched sounds or exaggerated tones to get the infant's attention, whereas

Japanese mothers may use nonsense or onomatopoeic sounds or calling by name to get attention from infants.

In conclusion, although the frequency and duration of mothers' vocalizations were not significantly different in this sample (see Fogel *et al.* 1988), the structure and the content of maternal speech were significantly different in the US and Japan. Our results suggest the mothers in both cultures may use language to convey cultural values from early infancy (Clancy, 1986). It appears that maternal speech reflects beliefs or values of the culture. What is selected and what is emphasized in speech may be culture-specific. However, in the present study, it is not clear what aspects of language development are affected by these different communicative styles in maternal speech. A longitudinal study might be helpful in understanding cultural influences on language acquisition and socialization, and on relationships among behaviour, language, communicative styles, beliefs and values in each culture.

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APPENDIX

Examples of BT used by Japanese mothers (adult equivalents in first column)

(1) Phonological alterations (38% of total baby talk occurred in this form)

(a)	[s]	[ʃ] [ʧ]
	Onaka suita?	Onaka shuita? or
	('Are you hungry?')	Onaka chuita?
	Asobimashoo	Achobimachoo
	('Let's play')	
(b)	[ts]	[tʃ]
	Kyukutsu ('Tight')	Kyukuchu
(c)	[z]	[j]
	Doozo ('Please')	Doojo
	Banzai ('Cheers')	Banjai

(2) Change of lexical items (see Chew, 1969)

(a)	Reduplication, with the first syllable accented:	
	Me ('Eye')	Meme
	Te ('Hands')	Tete
(b)	Reduplication modified by lengthening the medial consonant:	
	Kutsu ('Shoes')	Kukku
	Neru ('Sleep')	Nenne
(c)	First two syllables of the adult form modified by lengthening the medial consonant:	
	Okiru ('Get up')	Okki
(d)	The honorific affix *o-* is used extensively:	
	Chuusya ('Injection')	Ochuucha
	Me ('Eye')	Omeme
(e)	Adjectives reduplicated, with the second part accented:	
	Itai ('Ouch' or 'Painful')	Itai-itai

(f) Animals, machines and actions designated by the sounds they are supposed to produce:

Kuruma or Basu ('Car' or 'Bus')	Bu bu
Shakkuri ('Hiccup')	Hikku hikku
Naku ('Cry')	En en

(g) Inanimate items expressed like animate things by adding 'san':

Denki ('Lamp')	Denki-san
Gepp ('Belch')	Gepp-san

(h) Suffix added:

Daku ('Hug')	Dakko
Hoo ('Cheek')	Hoppe or Hoppeta

(i) Lexical items for which it is difficult to find a source in the adult language:

Kitanai ('Dirty')	Batchii
Suwaru ('Sit down')	Otchinko
Bonyuu ('Milk')	Oppai