Maternal speech to infants serves several significant functions in development. First, verbal interactions establish ties of proximity, closeness, and warmth between mother and baby (e.g., Kaye, 1982; Stern, 1985). Second, although prelingual infants may not benefit from lexical as much as prosodic features of speech directed to them (Papousek, Papousek, & Bornstein, 1985), maternal speech is acknowledged to play a substantial role in the child’s early language learning (e.g., Bornstein & Lamb, 1992; Garton, 1991; Harris, 1991; Rondal, 1985). Third, maternal speech begins the process of informing infants about themselves, about mother, and about the environment (e.g., Sachs, 1977). Last, but not least, to the extent that maternal speech reflects the communicational code of a culture, it plays a central role in socializing culturally appropriate communicative style (e.g., Blount, 1990; Clancy, 1986; Givon, 1985; Ochs, 1986). These multiple functions elevate maternal speech to babies to the level of a central subject of psychological, linguistic, and cultural study.

Developmental psycholinguists have approached the analysis of maternal speech to babies with different aims. One has been to evaluate its functional aspects, as for example, to contrast categories of speech where the intent is social interaction from speech that is directed toward describing or discovering the environment. In this vein, Brown (1977, p. 6) divided the universe of maternal speech addressed to infants into contrasting “features concerned with affection (affection-inspiring, tenderness-inspiring, intimacy-inspiring) and features concerned with communicative competence (verbal production, verbal
comprehension and cognitive competence). This basic division of maternal speech to infants into affect-salient and information-salient contents has been widely adopted (e.g., de Villiers & de Villiers, 1978; Folger & Chapman, 1978; Penman, Cross, Milgrom-Friedman, & Mears, 1983; Sherrod, Crawley, Petersen, & Bennett, 1978; Toda, Fogel, & Kawai, 1990). The present study follows in this tradition.

In a related vein, investigators have long speculated that the contents of maternal speech to infants should also be influenced by characteristics of the baby, including age and developmental level (e.g., Bates, 1976; Bruner, 1974/1975; Cross, 1977; Phillips, 1973; Sherrod, Friedman, Crawley, Drake, & Devieux, 1977). As infants grow over the 1st year, maternal speech patterns and actions toward them shift from feeling-oriented and self-marking content to object-oriented and environment-marking content in ways consistent with infants' increasing interest in their surroundings (Adamsen & Bakeman, 1984; Bornstein & Tamis-LeMonda, 1990; Penman et al., 1983). In an exemplary longitudinal analysis, Snow (1977) observed that mothers changed emphasis from discussing their infants' internal states and feelings to discussing activities and events in the immediate surround. For this reason, in the present study we analyzed speech in mothers with babies of two ages, 5 months and 13 months. By the middle of the infant's 1st year, conversations with mothers have taken on many mature characteristics, such as turn taking (Bornstein & Tamis-LeMonda, 1990; Cohn & Tronick, 1987; Kaye & Fogel, 1980; Stevenson, Ver Hoeve, Roach, & Leavitt, 1986), but the infant is still almost exclusively preverbal. By the start of the 2nd year, infants comprehend considerable amounts of speech they hear, and many are even themselves beginning to talk (Bates, Bretherton, & Snyder, 1988; Tamis-LeMonda & Bornstein, 1990).

In this study, we also evaluated maternal speech to infants in different cultural settings. Argentina, France, Japan, and the United States comprise an attractive comparative set in which to investigate universal as well as culture-specific aspects of developmental change and continuity in maternal speech. There are several reasons why. In these countries, we specifically chose to study maternal speech in Portenos, Parisians, Tokyo people, and New Yorkers. These particular locales and samples are similar in terms of modernity, level of industrialization, urbanity, per capita income, education, and standard of living; in all four, infant caregiving is significant, the family is nuclear in organization, and mother is normally the primary caregiver in the family setting. So, locales and samples are roughly comparable in terms of sociodemographics. However, considerable differences exist among the four in terms of history, culture, beliefs, and values concerned with child rearing. Thus, the particular comparison set we assembled directly contrasts cultural conditions of child rearing and disentangles them (to the degree possible) from economic and educational, urban-rural, modern-traditional, as well as ecological and climatic factors (see Jahoda, 1980; Munroe & Munroe, 1980; Triandis, 1989). In comparing mothers from Argentina, France, Japan, and the United States, we are also contrasting four distinct language communities: Spanish, French, Japanese, and American English. Furthermore, this quartet of cultures contrasts three Western societies and one Eastern society and so presents the possibility for creating a wider comparison than is typical of cross-cultural research (see Bornstein, 1980, 1989, 1991; Brilsin, 1983; Lewis & Ban, 1977; Piaget, 1966/1974; Super, 1981; Whiting, 1981). To analyze maternal speech comprehensively, it is both desirable and necessary to approach the topic from cross-national and cross-language perspectives.

Our chief purposes in this study, then, were to analyze and compare the language environments directed to younger and older infants in terms of two prominent classes of speech—effect salient and information salient—and to assess the generality or specificity of infant-directed speech in Argentine, French, Japanese, and American mothers. We hypothesized significant main effects for age for both affect- and information-salient speech; presumably, mothers communicate verbally more with their 13-month-old infants than with their 5-month-olds. We also hypothesized that significant differences would emerge for culture; for example, previous work indicates that American mothers emphasize information, and Japanese mothers, affect, in their speech to babies. Finally, we expected Age x Culture interactions; that is, cultural differences in functional emphases in maternal speech should more likely be manifest with older than with younger babies (Azuma, 1986; Bornstein, 1989; Caudill & Weinstein, 1969; Clancy, 1986; Morsbach, 1973; Toda et al., 1990).

Method

Subjects

Primiparous mothers and their 5- and 13-month-old infants, recruited from patient populations of private obstetric and pediatric groups in Buenos Aires, Paris, Tokyo, and New York City, were observed interacting at home. There were 24 and 24 Argentine, 18 and 18 French, 22 and 22 Japanese, and 22 and 25 U.S. American mother-infant dyads with infants of 5 and 13 months, respectively. All infants were term at birth and healthy at the time of the study, with a mean weight of 3.25 kg and an average length of 49.8 cm. The samples were balanced for sex of baby and came from comparable middle-class to upper middle-class households. Babies in the Argentine, French, Japanese, and American samples were the same age at the time of the 5-month home visit (M = 164 days, range of country means = 161-165) as well as the 13-month home visit (M = 407 days, range = 402-411). Mothers of babies in each of the two age groups were themselves approximately the same age (M = 29.7 years, range = 27.2-31.6, for mothers of 5-month-olds, and M = 30.4 years, range = 28.3-33.1, for...
mothers of 13-month-olds and had similar educational histories (mean number of years of post-high-school education = 3.5, range = 2.8-4.5, for mothers of 5-month-olds, and M = 3.6, range = 2.1-6.3, for mothers of 13-month-olds).

Procedure

Home observations were conducted identically in the four countries. Mothers were asked to behave in their usual manner and to disregard the observer's presence insofar as possible. Besides the observer, only mother and baby were present in the home, and observations took place at times of the day that were optimal in terms of individual babies' being in awake and alert states (see Bornstein, 1985; Bornstein & Tammis-LeMonda, 1990). Our goal in this study was to observe mothers under the most natural and unobtrusive conditions possible and not to alter the context of data collection beyond what would naturally occur in the home. Naturalistic interactions of mothers and infants were videotaped. A single female observer, always a native of the country, visited the home to videotape.

Measurement of Maternal Speech

Transcription. From the 175 videotapes, 15-min segments of mother-infant play with toys were first identified. Next, word-for-word transcripts were made of maternal language during those periods by native speakers. The transcripts were then compared with the videotapes by different native speakers, and necessary corrections were made (see Woods, Fletcher, & Hughes, 1986).

Categorization. Maternal speech was coded in terms of the primary function of each utterance. Several functional taxonomies of maternal speech have been developed (Della Corte, Benedict, & Klein, 1983; Folger & Chapman, 1978; Morikawa, Shand, & Kosawa, 1988; Penman et al., 1983; Rondal, 1985; Sherrod et al., 1978; Toda et al., 1990), and our analysis followed them closely. We identified two principal classes of utterances: (a) affect-salient speech—expressive, generally nonpropositional, idiomatic, or meaningless statements that included greetings, recitations, onomatopoeia, endearments, and the like, and (b) information-salient speech—normally fully propositional direct statements, questions, and reports about the infant, mother, or environment. A third class of other (including nonaffect, noninformation, and unintelligible) maternal speech was also identified. (Including this class in analyzing the two classes of interest also eliminated statistical limitations of linear dependence.) Together these three classes are mutually exclusive and exhaustive of maternal speech to infants. The Appendix provides definitions of affect- and information-salient speech and examples in each language.

The coding unit consisted of each utterance for which a single functional category could be reliably identified, and the unit changed when there was a change in coded utterance type or when an utterance terminated and a silence of at least 2 s ensued. Thus, the minimum unit size could be a single word. On the basis of these parameters, we determined the frequency of each class of maternal speech.

Coders were all natives of their respective countries, and the Argentine, French, and Japanese coders were also English-language bilinguals. All were trained in the functional classification system. During practice sessions, examples were provided and discussions held among coders to resolve infrequent disagreements. Maternal utterances were classified on the basis of the written transcripts. Coders were first trained on the transcripts of U.S. mothers; 20% of the U.S. transcripts were initially coded by all coders. Intercoder reliability was evaluated using correlations (r) for overall frequency of each category, the unit of analysis. Average intercoder correlations were .88 for affect, .92 for direct statements, .99 for questions, .92 for reports, and .60 for other. During the coding process, 20% of the transcripts within each of the four cultures were also coded by a second native-speaking coder. Average intercoder correlations were .90 for affect, .90 for direct statements, .96 for questions, .83 for reports, and .72 for other. These are high reliability values, and they give confidence in the resulting data. As can be seen in the Appendix, it is fairly easy to tell when a mother is making a direct statement to her baby, or questioning the baby, or reporting about the baby, or using affect-salient speech.

Preliminary Analyses

Outliers. Prior to any statistical appraisal of the results, univariate data were inspected in box plots (Tukey, 1977). Because of consistent outliers, the data from 2 Argentine, 2 Japanese, and 2 American mothers of 5-month-olds were omitted. Other outlying data were scattered and selectively eliminated from relevant analyses; therefore, ns in analyses differ. In all analyses, the maximum available n was used.

Frequencies and proportions. Amounts of affect- and information-salient maternal speech were analyzed in terms of frequency and were also transformed into proportions. Analyses of frequencies and proportions address different questions. When the absolute amount of speech to which a child is exposed is of interest, analysis of frequencies is appropriate. Examining frequencies assumes that infants are sensitive to absolute amounts of stimulation. When relative amount of stimulation within a particular frame of reference (such as total stimulation) is of interest, analysis of proportions is appropriate. The use of proportions eliminates individual and cultural differences in total speech: All mothers display a total speech of 1,0, and so relative emphases within this total can be compared directly across cultures. Because there is no substantive rationale for preferring frequencies to proportions, and because at one time or another a child might be sensitive to either absolute or relative amounts of different classes of maternal speech, we analyzed both frequencies and proportions. With one exception, fundamentally similar patterns emerged from the two analytic approaches. Consequently, we report results for frequencies—the more directly measured variable—and note the single difference that emerged for proportions.

Infant gender and maternal sociodemographics. Mothers of babies in each of the two age groups in each of the four countries were approximately the same age and had approximately the same number of years of post-high-school education. Approximately equal numbers of mothers of boys and girls in each locale participated in the study. Analyses of variance (ANOVAs) incorporating infant sex, mother age, and mother education were conducted for affect- and information-salient speech. No significant main effects for these variables emerged. In addition, none displayed significant interactions with either country or age (of infant). For this reason, we pooled the data for maternal speech to boys and girls.

Results

Multivariate analyses of variance (MANOVAs) were conducted separately for frequencies and proportions in the stepwise fashion. We first analyzed total affect and information as dependent variables. With regard to information, a MANOVA was used as a first step designed to determine whether it was necessary to analyze subcategories. Total information itself was not investigated further with respect to pairwise comparisons among cultures. We then examined the three subcategories of information—direct statements, questions, and reports—to verify which might be "responsible" for culture and Age X Culture effects. The main effect of culture was explored via the Newman-Keuls range test, controlling Type I error at $\alpha = .05$. Pairwise comparisons of cultures for significant Age X Culture
effects were conducted using two-way ANOVAs. Because there were four cultures, six pairwise ANOVAs were possible, only three of which were orthogonal. To adjust for nonorthogonal comparisons at α = .05, we used a modified Bonferroni test (Keppel, 1982). This yielded the requirement that interaction effects be considered significant only when p ≤ .025.

**Total Affect and Information**

Table 1 displays mean frequencies for total affect and information classes of maternal speech across two ages and four cultures. A MANOVA specifying total affect and information as dependent variables yielded significant main effects for age and culture and a significant Age × Culture interaction, $\text{F}(2, 104) = 51.98$, $\text{F}(6, 210) = 16.93$, and $\text{F}(6, 210) = 7.35$, respectively, ps < .001. As expected, univariate analyses revealed significant age effects for both affect- and information-salient classes of maternal speech, $\text{F}(1, 105) = 22.59$ and $97.93$, respectively, ps < .001. To explore these effects further, we examined the three subcategories of information separately: direct statements, questions, and reports.

### Table 1

**Mean Frequencies for Affect-Salient and Information-Salient Maternal Speech Across Two Ages and Four Cultures**

<table>
<thead>
<tr>
<th>Age</th>
<th>Argentina</th>
<th>France</th>
<th>Japan</th>
<th>United States</th>
<th>All cultures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Affect-salient speech</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 months</td>
<td>$M$</td>
<td>77.2</td>
<td>64.3</td>
<td>82.7</td>
<td>56.2</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>26.7</td>
<td>20.6</td>
<td>46.8</td>
<td>30.4</td>
</tr>
<tr>
<td>13 months</td>
<td>$M$</td>
<td>92.2</td>
<td>59.9</td>
<td>129.9</td>
<td>86.6</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>21.7</td>
<td>19.6</td>
<td>48.6</td>
<td>26.1</td>
</tr>
<tr>
<td>Both ages</td>
<td>$M$</td>
<td>84.5</td>
<td>61.9</td>
<td>107.0</td>
<td>72.3</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>25.2</td>
<td>19.8</td>
<td>52.8</td>
<td>26.1</td>
</tr>
<tr>
<td></td>
<td>Information-salient speech</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 months</td>
<td>$M$</td>
<td>58.8</td>
<td>55.2</td>
<td>38.8</td>
<td>50.4</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>25.5</td>
<td>29.2</td>
<td>26.2</td>
<td>29.4</td>
</tr>
<tr>
<td>13 months</td>
<td>$M$</td>
<td>145.9</td>
<td>68.6</td>
<td>90.8</td>
<td>129.2</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>31.8</td>
<td>37.6</td>
<td>38.9</td>
<td>34.4</td>
</tr>
<tr>
<td>Both ages</td>
<td>$M$</td>
<td>109.6</td>
<td>60.9</td>
<td>65.5</td>
<td>92.8</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>52.3</td>
<td>33.0</td>
<td>42.1</td>
<td>50.9</td>
</tr>
</tbody>
</table>

**Subcategories of Information**

**Considered together.** Table 2 displays mean frequencies of maternal speech for the three subcategories of information-salient speech. A MANOVA specifying the three categories as dependent variables revealed significant main effects for age and culture and a significant Age × Culture interaction, $\text{F}(3, 126) = 39.14$, $\text{F}(9, 374) = 13.66$, and $\text{F}(9, 374) = 6.00$, respectively, ps < .001.

**Direct statements.** Univariate analysis revealed significant main effects for age and culture, $\text{F}(1, 128) = 79.42$ and $\text{F}(3, 128) = 31.86$, respectively, ps < .001. In addition, a significant Age × Culture interaction emerged, $\text{F}(3, 128) = 8.08$, p < .001.
Examination of the age effect showed that mothers make direct statements to their 13-month-olds more than 2.5 times as much as mothers do to their 5-month-olds, and the Newman-Keuls range test showed Argentine mothers display significantly higher frequencies of direct statements than their counterparts in France, Japan, and the United States. No other pairwise comparison for the main effect of culture was significant. Pairwise examination of the Age X Culture interaction showed significant effects for the three comparisons involving Argentine mothers: Argentina–France, \( F(1, 68) = 12.24 \); Argentina–Japan, \( F(1, 71) = 18.71 \); and Argentina–United States, \( F(1, 75) = 8.11 \); \( ps < .01 \). Figure 2, Panel A shows these interactions; they must be interpreted with caution, however, because they do not cross over (Argentine mothers at 5 months showed the highest frequency of the four cultures, and it is possible that their greater slope is due to scaling). All three interactions show the same pattern—the increase from 5 to 13 months is greater for Argentine mothers as compared with mothers in the three other cultures—as expected, because the French, Japanese, and U.S. American mothers displayed statistically equivalent patterns.

Questions. Univariate analyses revealed significant age and culture main effects, \( F(1, 128) = 33.73 \) and \( F(3, 128) = 7.08 \), respectively, \( ps < .001 \). Mothers of 13-month-olds asked their infants almost twice as many questions as mothers of 5-month-olds asked their infants. The Newman-Keuls range test showed that U.S. mothers more frequently asked their infants questions than did French or Japanese mothers and that Argentinean mothers asked more questions than Japanese mothers. (See Figure 2, Panel B.)

Reports. Univariate analysis revealed significant main effects for age, \( F(1, 128) = 72.20, p < .001 \), and culture, \( F(3, 128) = 3.42, p < .05 \). In addition, a significant Age X Culture interaction emerged, \( F(3, 128) = 9.65, p < .001 \). Mothers of 13-month-olds reported to their infants about the infants, about themselves, or about the environment almost 2.5 times as much as...
Table 2
Mean Frequencies for Subcategories of Maternal Information-Salient Speech Across Two Ages and Four Cultures

<table>
<thead>
<tr>
<th>Age</th>
<th>Argentina</th>
<th>France</th>
<th>Japan</th>
<th>United States</th>
<th>All cultures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Direct statements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 months</td>
<td>19.8</td>
<td>13.3</td>
<td>6.4</td>
<td>9.3</td>
<td>12.3</td>
</tr>
<tr>
<td>M</td>
<td>11.6</td>
<td>10.8</td>
<td>4.4</td>
<td>6.7</td>
<td>10.1</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 months</td>
<td>52.1</td>
<td>24.6</td>
<td>15.9</td>
<td>26.1</td>
<td>31.2</td>
</tr>
<tr>
<td>M</td>
<td>16.8</td>
<td>13.3</td>
<td>7.6</td>
<td>11.9</td>
<td>19.2</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both ages</td>
<td>37.0</td>
<td>18.6</td>
<td>11.2</td>
<td>17.9</td>
<td>21.8</td>
</tr>
<tr>
<td>M</td>
<td>21.7</td>
<td>13.1</td>
<td>7.8</td>
<td>12.8</td>
<td></td>
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<tr>
<td>SD</td>
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<tr>
<td></td>
<td>Questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 months</td>
<td>24.4</td>
<td>18.9</td>
<td>17.8</td>
<td>26.5</td>
<td>22.3</td>
</tr>
<tr>
<td>M</td>
<td>11.8</td>
<td>9.9</td>
<td>13.0</td>
<td>20.0</td>
<td>18.5</td>
</tr>
<tr>
<td>SD</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 months</td>
<td>40.6</td>
<td>33.6</td>
<td>26.6</td>
<td>49.2</td>
<td>38.3</td>
</tr>
<tr>
<td>M</td>
<td>15.0</td>
<td>20.7</td>
<td>12.9</td>
<td>17.8</td>
<td>18.4</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both ages</td>
<td>32.9</td>
<td>26.0</td>
<td>22.5</td>
<td>38.6</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>15.7</td>
<td>17.4</td>
<td>13.5</td>
<td>21.5</td>
<td></td>
</tr>
<tr>
<td>SD</td>
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<tr>
<td></td>
<td>Reports</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>5 months</td>
<td>19.2</td>
<td>27.6</td>
<td>17.3</td>
<td>19.3</td>
<td>20.7</td>
</tr>
<tr>
<td>M</td>
<td>12.2</td>
<td>16.7</td>
<td>13.1</td>
<td>12.5</td>
<td>14.0</td>
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<tr>
<td>SD</td>
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<td></td>
</tr>
<tr>
<td>13 months</td>
<td>55.3</td>
<td>30.6</td>
<td>46.5</td>
<td>56.0</td>
<td>48.4</td>
</tr>
<tr>
<td>M</td>
<td>19.4</td>
<td>21.4</td>
<td>23.4</td>
<td>20.9</td>
<td>23.0</td>
</tr>
<tr>
<td>SD</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Both ages</td>
<td>39.4</td>
<td>29.1</td>
<td>32.6</td>
<td>39.7</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>24.5</td>
<td>19.0</td>
<td>24.1</td>
<td>25.4</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Mothers of 5-month-olds reported to their infants. Despite an overall significant $F$ for culture, no significant pairwise differences emerged: Pairwise differences that might exist, therefore, are small. Pairwise examinations of the Age $\times$ Culture interaction for reports were significant for the three comparisons involving French mothers: France-Argentina, $F(1, 68) = 22.93$; France-Japan, $F(1, 63) = 13.05$; and France-United States, $F(1, 67) = 17.10$; $p < .001$. As with direct speech, all three significant interactions show the same pattern (Figure 2, Panel C): Relative to mothers of other cultures, French mothers showed a smaller increase in reports between 5 and 13 months.

Discussion

This study compared the functional contents of Argentine, French, Japanese, and U.S. American mothers' speech to their 5- and 13-month-old infants in the natural setting of the home. We first review and comment on the results of the study in terms of cultural universals and specifics in maternal speech and then discuss more general issues about maternal speech to infants in its cultural context.

Mothers in these three Western cultures and one Eastern culture showed general similarity in certain aspects of speech to infants. These findings submit to cross-cultural evaluation the universality of developmental processes related to maternal speech. First, the consistency and face validity of findings resulting from the cross-cultural application of the present categorization scheme of maternal speech give evidence of its generalizability to culturally contrasting settings. Apparently, maternal language to infants nearly universally contains affect-salient as well as information-salient topics. Results of the present study also show that a functional perspective on maternal speech is applicable to infants of two ages in four different language communities across three Western cultures and one Eastern culture. It is likely that mothers everywhere intend to share feelings and contribute to emotional exchanges via their affect-salient speech to babies, just as they wish to impart or confirm cognitive information referential of infant perceptual experiences. Perhaps these are universal aspects of parenting (Papoušek & Papoušek, 1987; Vigilant, Stoneking, Harpending, Hawkes, & Wilson, 1991). Furthermore, no systematic sex effects or effects ascribable to maternal age or education emerged for maternal speech in these samples; but we limited variation in these dimensions, and these factors could be expected to influence maternal speech in other samples.

Mothers in the four cultures showed some similarity in the
Figure 2. Maternal information-salient speech to infants of two ages in four cultures for (top panel) direct statements, (middle panel) questions, and (bottom panel) reports.
types and frequency of functional classes of speech they addressed to infants. Notably, predicted age effects emerged for affect- and information-salient speech. Mothers as a group increase the frequency with which they use both categories of speech as their infants approach their first birthdays. Provocatively, the age effect that emerged for affect was reversed when we analyzed proportions—between 5 and 13 months, the frequency of affect-salient speech climbs, but affect becomes a smaller proportion of total maternal speech. Penman et al. (1983) also found relatively greater increases in information-oriented versus affect-oriented classes of Australian mothers' speech to 3- and 6-month-old infants. Thus, independent of culture, mothers speak more to older infants, but "relatively speaking," information-salient versus affect-salient speech increases in emphasis with age in all cultures.

Argentine, French, Japanese, and U.S. American mothers also favored affect over information in speaking to their 5-month-old infants and information over affect in speaking to their 13-month-old infants. Examination of information subcategories showed that the mean frequency of the three approximately doubled with age. Apparently, over the second half of the 1st year of life, mothers tend to expect that their infants need to be directed more, expect that their infants know more or will perhaps better comprehend their questions, and expect that they can and should give their infants more information about the infants themselves, their mothers, and the environment. During this period, infants themselves are also of course beginning to talk, a fact that may encourage mothers to speak to them more in an increasingly adult-oriented conversational manner.

There were also exceptions to these generalities and variations in the speech of mothers in these four cultures that appear to reflect general cultural beliefs and values. Variation in affect-oriented speech appeared across the four cultures: Japanese mothers were highest in the use of affect-salient speech, meaning that they used the most grammatically incomplete utterances and that they played with sounds in speaking to their babies, using nonsense, onomatopoeia, song, and the like, more than did mothers of the other cultures. This result replicates and expands on the work of Toda et al. (1990), who found in the laboratory that Japanese mothers used nonsense, onomatopoeic utterances, and calling by name to their 3-month-olds more than did American mothers. The Japanese mother's goal in early child rearing is to empathize with her infant's needs—to meet her infant at the infant's level—as is well recognized, rather than to show authority as mother (Befu, 1986; Bornstein, Azuma, Tamis-LeMonda, & Ogino, 1990; Doi, 1973; Kojima, 1986a, 1986b). Reciprocally, the evidence that, relatively speaking, mothers from the three Western cultures favor information-salient speech and more often use grammatically complete utterances in speaking to babies—that is, speech more characteristic of adult-adult conversation—is consistent with the view that these mothers are more interested in supporting individual expression and imparting information to their children from an early age.

Variations in categories of information-oriented speech also emerged across these cultures. First, Argentine mothers displayed higher frequencies of direct statements than mothers in the three other cultures. In Argentina, the traditional child-rearing orientation is authoritative; that is, to direct a child's action is to behave positively toward the child and to express care and love in preparing the child for development (Aguinis, 1988; Diaz Rossello, 1988; Fillol, 1961). Blount (1990) noted that Spanish-speaking mothers rely comparatively more than English-speaking mothers on attentionals (utterances designed to attract the child's attention) and high volume in interactions with their 9- to 22-month-olds. Even in schooling, Argentines favor direct transmission of knowledge as, for example, by demonstration (Pascual, 1991; Petty, 1986). Perhaps the use of these features of speech stems from a view of infants and children as in need of instruction. The interaction effect showed that Argentine mothers more often directed their 13- than their 5-month-olds relative to mothers in the three other cultures, implying that as culture takes hold of language directed at the child, its effects may increase.

Second, U.S. American mothers tended to question their infants the most. It is unlikely that American mothers believe that their 5- or even 13-month-olds will answer their questions, or even need to, because many questions are asked about ongoing activities or about things in plain view. Rather, question asking of infants may be a way for American mothers to emphasize the information components of speech. After all, asking "What does that toy do?" goes beyond simply posing a question; it conveys information via labeling, for example, and at the same time does so in a most attention-getting way, as through the use of interrogative prosody (Bornstein & Lamb, 1992). Questions also emphasize the child's participation in his or her own language development in contrast to mothers' use of descriptions; this is a "distancing strategy" thought to promote cognitive development (Sigel, 1982).

Third, French mothers speak to their younger infants like other mothers, but they increased the frequency of their reports to older infants at a lower rate than mothers in the other three cultures. Reputedly, French mothers place less emphasis on achievement stimulation and more emphasis on emotional support and use language to establish closeness (Dion, 1989), an opinion consonant with their lower level of reporting to babies (found here) and their lower level of didactic activity and responsiveness overall (Bornstein et al., in press; Bornstein, Tamis-LeMonda, Pécheux, & Rahn, 1991). It might also be that French mothers approach speech to their babies with a more egalitarian, adult-adult orientation.

It is important to recognize that mothers in only four cultures were sampled in this study, and that the samples of mothers in these four locales were comparatively restricted in terms of sociodemographic characteristics, including urban location, economic status, and educational history. These restrictions actually aid the comparisons we undertook, because the four samples were similar on these variables. However, they also have implications for the generalizability of the findings, because different results could emerge in other samples or in samples from less metropolitan environments, from other regions of the socioeconomic status scale, or from less educated families in these four countries. Moreover, we concentrated these analyses on functional aspects of maternal speech occurring in free-play interactions at home; analyses of other aspects of speech in mothers or of the same or different aspects of speech in other situations may result in similar or different patterns of
findings. Finally, mothers in the four countries spoke different languages, and in this study we did not attempt to disentangle language from culture. Perhaps language and culture are most meaningfully considered together. However, “natural experiments” that separate language and culture (to the degree possible) could be invoked to identify cultural versus linguistic influences on maternal speech, as for example by comparing different cultures in which the same language is spoken.

One of the ways infants become socialized into culture is through integrating maternal behavior and speech into their development, and one of the ways they do this is via mother-infant communication. The general association between culture and development has been conceived in terms of several fundamentally different models. One traditional and influential paradigm suggests that cultural norms, convictions, images, and rules influence the development of parental beliefs about children, their abilities, character, needs, temperament, and so forth, and that in turn these parental beliefs (somehow) translate themselves into the verbal, enactive, and responsive practices that parents use to achieve their child-rearing goals (e.g., Bateson & Mead, 1942; Benedict, 1938; Caudill, 1973; Tapp, 1980; Whiting & Child, 1953). The present findings suggest that this model, at least in part, validly describes cultural forces that shape maternal speech to infants. At the same time, however, universal aspects of infancy, such as the dramatic growth of competence over the 1st year, appear also to exert control over the contents of maternal speech.

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Appendix

Maternal Speech

Affect-salient speech consisted of expressive, generally nonpropositional, idiomatic, or meaningless statements and included, among other categories, the following:

   - English: Hello there.
   - French: Bonjour.
   - Japanese: Konnichiwa.
   - Spanish: Hola!

2. Recitations: Nursery rhymes and the like.
   - English: Peek-a-boo.
   - French: La petite bête qui monte, qui monte.
   - Japanese: Inai inai ba!
   - Spanish: Cucú.

3. Onomatopoeia: Formation of a word by imitation of the sound of the thing named.
   - English: Meow, meow (cat).
   - French: Tic, tac (clock).
   - Japanese: Moo, moo (cow).
   - Spanish: Guau, guau, guau (dog).

4. Endearments.
   - English: Sweetie.
   - French: Ma puce.
   - Japanese: Bokuchan.
   - Spanish: Mi bichito.

Information-salient speech consisted of fully propositional sentences about infant, mother, or the environment and included the following:

1. Direct statements.
   - English: Try one more time.
   - French: Tu vas le chercher.
   - Japanese: Ocha chodai.
   - Spanish: Mirá, mirá el oso.

2. Questions.
   - English: What does that toy do?
   - French: Tu veux jouer?
   - Japanese: Nani shiteruno?
   - Spanish: ¿Querés gatear bebé?

3. Reports.
   - English: You sure do like your blocks, don't you?
   - French: Tu es contente de la voir.
   - Japanese: Kowakatta none.
   - Spanish: Ese sólo te gusta ahora.

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