Maternal Responsiveness to Infants in Three Societies: The United States, France, and Japan

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BORNSTEIN, MARC H.; TAMIS-LEMONDA, CATHERINE S.; TAL, JOSEPH; LUDEMANN, PAMELA; TODA, SUEKO; RAHN, CHARLES W.; PÉCHEUX, MARIE-GERMAINE; AZUMA, HIROSHI; and VARDI, DANYA. Maternal Responsiveness to Infants in Three Societies: The United States, France, and Japan. CHILD DEVELOPMENT, 1992, 63, 808–821. This study examines and compares prominent characteristics of maternal responsiveness to infant activity during home-based naturalistic interactions of mother-infant dyads in New York City, Paris, and Tokyo. Both culture-general and culture-specific patterns of responsiveness emerged. For example, in all 3 locales infants behaved similarly, mothers also behaved similarly with respect to a hierarchy of response types, and mothers and infants manifest both specificity and mutual appropriateness in their interactions: Mothers responded to infants’ exploration of the environment with encouragement to the environment, to infants’ vocalizing nondistress with imitation, and to infants’ vocalizing distress with nurturance. Differences in maternal responsiveness among cultures occurred to infant looking rather than to infant vocalizing and in mothers’ emphasizing dyadic versus extradyadic loci of interaction. Universals of maternal responsiveness, potential sources of cultural variation, and implications of similarities and differences in responsiveness for child development in different cultural contexts are discussed.

Strike while the iron is hot.
Il faut battre le fer quand il est chaud.
鉄は熱いうち打てる。

Systematic child-rearing practices are often credited, locally, with providing experiences that influence the course and outcome of individual development and, globally, with contributing to the distinctiveness of cultural style. One type of parenting thought to be influential in this way is responsiveness, the reactions to their children’s activities that parents often display in the context of dyadic exchange. This report

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focuses on cultural universals and cultural specifics of several salient types of maternal responsiveness to prominent infant activities as they may be observed at home in naturalistic interactions of mother-infant dyads in the United States, France, and Japan. This study is one of a series of parallel longitudinal cross-cultural investigations.

Responsiveness has attracted the attention of developmental researchers for two main reasons. First, it reflects faithfully a recurring and significant three-term event sequence in everyday exchanges between child and parent that involves child act, parent reaction, and effect on child (e.g., Ainsworth, Bell, & Stayton, 1974; Bornstein, 1989a; Lewis & Goldberg, 1969; Watson, 1985). Second, parental responsiveness has been found to possess meaningful predictive validity over diverse domains of children’s development (e.g., Ainsworth et al., 1974; Beckwith & Cohen, 1989; Bornstein & Tamis-LeMonda, 1989; Bradley, 1989; Coates & Lewis, 1984; Crockenberg, 1981, 1983; Goldberg, Løkjasek, Gartner, & Corter, 1989; Lewis & Goldberg, 1969; Rabain-Jamin, in press; Sigman et al., 1988; Yarrow, Rubenstein, & Pedersen, 1975).

Two objectives motivated the present research. First, in the extant literature responsiveness has frequently been assessed as a unidimensional attribute of mothers (see Martin, 1989); for this study, a more differentiated approach to responsive parenting was adopted. Second, most psychological investigation is monocultural in character, and critics regularly decry implicit cross-cultural generalizations from such findings (e.g., Berry, 1983; Bomstein, 1980; Kennedy, Scheirer, & Rogers, 1984; Moghaddam, 1987; Russell, 1984; Sexton & Misiak, 1984; Triandis, 1980). For this study, direct observations of child rearing were pursued in a cross-cultural developmental comparison. This approach is commonly acknowledged by empiricists and theoreticians alike as not only necessary for testing the limits of generalization but as requisite for gaining a fuller understanding of developmental processes (e.g., Bornstein, 1989b, 1991; Brislin, 1983; Bruner, 1989; Lewis & Ban, 1977; Nugent, Lester, & Brazelton, 1989; Piaget, 1966/1974; Super, 1981; Whiting, 1981).

New York City, Paris, and Tokyo represent an especially appealing and potentially informative comparative base on which to investigate specific as well as universal aspects of child-rearing practices such as maternal responsiveness. These three locales are much alike in terms of modernity, urbanity, economics, ecology, and climate, and therefore it is possible to obtain roughly equivalent sociodemographic samples from the three. In the three societies of which they are a part, the family is typically nuclear in organization, mother is normally the primary caregiver in the family setting, and parents share many of the same goals for their children, notably psychosocial adjustment, educational achievement, and economic security.

However, substantial differences exist among the three in terms of history, beliefs, and values associated with child rearing. On this basis, the three societies are thought to have established somewhat different expectations of their peoples and to differ in the child-rearing styles they employ to attain central cultural goals. Broadly speaking, the American mother is believed to be interested in promoting autonomy in her infant, and organizes her interactions so as to foster physical and verbal independence in the child; the French mother is believed to share some of these characteristics and goals, but sees emotional support and psychoaffective security as primary and achievement stimulation as secondary; the Japanese mother is believed to see her infant as an extension of herself and works with her child to consolidate and strengthen a mutual dependence between them (see Befu, 1986; Bellah, Madsen, Sullivan, Swindler, & Tipton, 1988; Caudill, 1973; Chen & Miyake, 1984; Clancy, 1986; Dion & Pécheux, 1989; Doi, 1973; Dolto, 1979; Fogel, Toda, & Kawai, 1988; Gramont, 1969; Hess et al., 1986; Hoffman, 1963; Kojima, 1986; Maranda, 1974; Metraux & Mead, 1954; Morsbach, 1980; Pomerleau, McNair, & Sabattier, 1991; Weisz, Rothbaum, & Blackburn, 1984). The particular cultural comparisons explored here set up direct contrasts among child-rearing conditions by disentangling 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).
These considerations of cultural style in child rearing led to certain expectations about maternal responsiveness: Some types of responsiveness in mothers in these three cultures were anticipated to be similar and some to vary relative to divergent cultural goals of parenting. For example, we hypothesized that mothers in different cultures would not vary substantially in responding to infant vocal distress or nondistress. Inasmuch as responsiveness to infant distress is thought to have evolved an adaptive significance for eliciting and maintaining proximity and care, responsiveness to vocal distress may be essentially universal (e.g., Ainsworth, 1973; Bowlby, 1969; Lester & Boukydis, in press; Murray, 1979; Tal & Bornstein, in press). Likewise, the joint activity of vocal nondistress and responsiveness that constitutes social communication takes place in a "format" (Bruner, 1982) universally characterized by the turn-taking constraint (e.g., Kaye, 1982; Papoušek, Papoušek, & Bornstein, 1985; Stern, 1985). However, we anticipated that mothers in this variety of cultural settings would diverge with respect to more discretionary interactions, as in determining which infant attentional behaviors to respond to and how to respond to them (see deVries & Sameroff, 1984; Lerner, 1989; Super & Harkness, 1986). For example, we hypothesized that American mothers would tend to emphasize environment-oriented responsiveness by incorporating the world outside the dyad into their interactions and that Japanese and French mothers would tend to emphasize responsiveness oriented within the dyad.

Our study focused on maternal responsiveness in middle infancy; by this age, the baby's scope of interaction includes both the dyad and the surrounding world, and "conversations" between infants and their mothers are assuming many mature characteristics (Belsky, Gilstrap, & Rovine, 1984; Bornstein & Tamis-LeMonda, 1990; Cohn & Trawick, 1987; Kaye & Fogel, 1980; Stevenson, Ver Hoeve, Roach, & Leavitt, 1986). For the infant, attention and vocalization serve as principal gauges of state of arousal and affect, as well as of cognitive, communicative, emotional, and social functioning (Bornstein & Lamb, 1992). These are the most frequent and most prominent behaviors in infants, and those which mothers monitor closely. For these reasons, we assessed and compared maternal responsiveness to infant attention in the "visual channel," that is, to mother and to the environment outside the dyad, and to infant expression in the "vocal channel," that is, nondistress and distress vocalization.

Method

Subjects.—In total, 72 primiparous mothers and their 5-month-old infants, recruited from patient populations of private obstetric and pediatric groups in New York City, Paris, and Tokyo, were observed; 24 dyads were Caucasian American, 24 were Caucasian French, and 24 were Oriental Japanese. All infants were term at birth and healthy up to and at the time of the study. Babies in the American, French, and Japanese samples were statistically the same age at the time of the home visits, M's = 165, 161, and 163 days, and their mothers were statistically the same age, M's = 31, 32, and 29 years, and had similar educational histories, M number of years post high school = 4.5, 3.6, and 2.8, all F's < 2. The samples were each balanced for sex of baby and came from comparable middle- to upper-middle-class households.

Home observation procedure.—Home observations were conducted identically in the three locales. Briefly, mothers were asked to behave in their usual manner and to disregard the observer's presence insofar as possible; beside the observer, only mother and baby were present; and observations took place at times of the day that were optimal in terms of individual babies being in awake and alert states. A female observer, always a native of the country, visited the home to conduct the observation. After a period of acclimation, mothers and infants were videotaped in naturalistic interaction for 45 min.

Measurement of infant activity and maternal responsiveness.—Every occurrence of four stimulus infant activities and five types of maternal responsiveness was scored from videotapes. Stimulus infant activities included: (1) extradyadic visual attention (infant looks at a property, object, or event in the environment); (2) dyadic visual attention (infant looks at mother's face); (3) nondistress vocalization (excluding bodily vegetative, grunts, and effort sounds); and (4) distress vocalization. Infant activities were scored in two "modes" (i.e., groups of mutually exclusive and exhaustive behaviors) using a computer-based coding system on two separate passes through the videotapes. The two modes consisted, respectively, of attention (extradyadic, dyadic, and blank staring
or not looking) and vocalization (nondistress, distress, and bodily sounds or silence). Coders used preprogrammed computers to record the onset of each infant look and vocalization. For data reduction, computers were programmed to define a vocalization as lasting a minimum of .3 sec, and to credit the infant with a second vocalization if a vocalization change or silence of 2 secs or more were recorded; a look was defined as lasting a minimum of .3 sec, and the infant was credited with a new look if the infant engaged in another look or closed eyes for 1.5 sec or more. These parameters followed common conventions (see Bornstein, 1985; Colombo & Horowitz, 1985; Fogel et al., 1988).

Four main types of maternal responses were coded. They were: (1) extradyadic (mother physically and/or verbally indicates a property, object, or event in the immediate environment); (2) dyadic (mother engages infant in affective interpersonal interactions, including proximal en-face exchange, kissing, hugging, tickling, kinesthetic social arousal, and games like peek-a-boo); (3) nurturant (mother engages in feeding, pacifying, diapering, or picking up to comfort); and (4) imitative (mother repeats infant’s vocalization). To complete the mutually exclusive and exhaustive nature of the coding scheme, the balance of other maternal reactions, not definable as extradyadic, dyadic, nurturant, or imitative, was also coded: Some of these were verbal exclamations or affirmations, such as the English “Good boy!” the French “Ah oui!” and the Japanese “Nani”; some were noncontent and automatic utterances such as “Yeah!” and “Oh-oh!”; some were rhetorical questions such as “What?”; and some were nonimitative babbling or other intelligible or unintelligible sounds to the infant such as “Shush.” The focus of this paper falls on the first four types of maternal response; we consider these more substantive and deliberative. Also, the literature suggests that these response types (reinforcement of infant attention allocation, affective interaction, solicitousness, and vocal imitation) play a continuing and meaningful role in the mental, communicative, emotional, and social life of the young child (Bornstein & Lamb, 1992).

In order for a maternal activity to be credited as responsive, the mother had to demonstrate a change in her ongoing behavior within 5 sec of a change in an infant visual or vocal activity. Only the first response of mother after the infant behavior change was counted, and maternal responsiveness to changes in individual infant visual and vocal activities were evaluated separately. (Infants vocalize and look simultaneously, too, and sometimes maternal responsiveness is elicited by and keyed to overlapping infant behaviors. In this study, we evaluated maternal responsiveness to changes in individual infant behaviors only.) If infants changed activities in a 5-sec window, either within channel, across channels, or both (e.g., following silence, by vocalizing nondistress and then looking to a ball), mothers could be credited with responding more than one time within the time frames allotted if the infant’s separate stimulus acts received separate responses. Each response within the 5-sec scoring window of its stimulus was thus coded separately for its response type in reference to the stimulus act.

Maternal responsiveness was predominantly “co-occurring” when the infant looked at objects or at mother or vocalized distress, whereas maternal responses to infant nondistress vocalizations were predominantly “lagged.” Therefore, for extradyadic and dyadic attention allocation and for distress vocalization, responsiveness was credited using a “leading-edge trigger,” that is, the onset of the response had to occur within 5 sec of the onset of the antecedent infant stimulus activity. In the case of infant nondistress vocalization, responsiveness was credited according to a “trailing-edge trigger,” that is, within 5 sec of the offset of the infant’s vocalization.

The following measures were calculated: (1) base-rate frequencies for each infant behavior; (2) the frequency of total maternal responsiveness; (3) the frequency of each of the five types of maternal responses; (4) the frequency with which mothers responded to each of the four stimulus infant activities; and (5) the frequency of each type of maternal response to each stimulus infant behavior. Prior to any statistical appraisal, univariate data were inspected in box plots; no outliers were found that altered basic patterns of results. Approximately 1.7% of the French data was prorated since six tapes were missing an average of 3.8 min each. Preliminary analysis indicated no systematic sex differences in the base-rate and responsiveness data from the three cultures, and therefore analyses collapsed across this factor.

Infant activity and maternal responsiveness were scored by different coders so that coders would be blind to different data sets.
Reliability of scoring was assessed using kappa (Cohen, 1968; Hartmann & Wood, 1982). For infant activity modes, coders randomly and independently scored approximately 10% of the tapes for each mode. Kappa for infant base-rates was computed at the level at which it was coded (since behaviors in the modes were mutually exclusive and exhaustive), that is, for frequencies within channel. Within the visual mode average kappa was .50, and within the vocal mode average kappa was .81. Maternal responsiveness was coded by individuals who were fluent in both English and the language of the society. Reliability of scoring maternal responsiveness was assessed by having different coders independently score 25% of the tapes against standards of another experienced coder. Kappas for the four categories of responsiveness (and other) ranged from .52 to .79 and averaged .67.

Infant state.— Another set of independent coders rated the infant’s state according to a six-level scale (modified from Brazelton, 1973) for the first second of each 60 sec of the observation (Suen & Ary, 1989). American, French, and Japanese infants were judged to be in states of quiet or active alert in 94%, 93%, and 94% of these momentary samples, respectively.

Results

Infant base-rates and maternal responsiveness in the three societies were assessed and compared in several ways. Frequencies of infant activities, proportions of the four maternal response types, ratios of maternal responsiveness to each of the four specific kinds of infant activities, and proportions at which mothers displayed different response types to each of the four specific infant activities were examined and analyzed separately. For each data type, the main effect of culture was determined using MANOVA or nonparametric ANOVA. Two channels of information exchange between mother and infant, visual and vocal, were also examined via two types of visual and two types of vocal behavior, allowing for the analysis of culture × behavior interactions within each channel. Mothers in the three societies were compared on their relative responsiveness to infants’ extradyadic- and dyadic-oriented behaviors (i.e., the differences between mothers’ responsiveness to infant extradyadic and dyadic activities were compared across cultures). Similarly, mothers in the three societies were compared on their relative responsiveness to infants’ nondistress and distress vocalizations. The category of other responses is included in comparisons of overall maternal responsiveness; however, analyses focus on the four main categories of maternal responsiveness, and consideration of other responses is reserved for the discussion. Including the category of other response in the denominator, and analyzing the four response types of chief interest, also eliminated statistical limitations ascribable to linear dependence.

Infant base rates.— Table 1 displays means and standard deviations for base rates of four infant activities in the three cultures. Frequencies of infant activities were compared across cultures using a one-way MANOVA; this analysis revealed no significant effect of culture. Since one-way MANOVA does not directly allow assessment of interactions, interactions within visual and vocal channels were examined by differencing the variables within each channel (e.g., extradyadic minus dyadic) and analyzing these differences using one-way ANOVA. Error in pairwise comparisons was controlled at α < .05 using the Newman-Keuls range test. Examination of culture × base rate interactions within both visual and vocal channels revealed no significant effects. Overall, infants in the three cultures displayed statistically equivalent patterns of behavior. If infant behavior is viewed, in part, as an invitation for mothers to interact, this equivalence suggests that mothers in three cultures were overall offered similar opportunities to respond.

Maternal response types.— Table 2 shows proportions of total maternal responsiveness for the four main categories of maternal response and other. These proportions were computed by dividing the frequency of each mother’s response type by her total responsiveness. Thus, these proportions statistically control for infants’ overall activity (i.e., each mother’s proportions,
TABLE 1
BASE-RATE FREQUENCIES OF INFANT BEHAVIORS FOR THREE CULTURES

<table>
<thead>
<tr>
<th></th>
<th>Extradyadic</th>
<th>Dyadic</th>
<th>Nondistress</th>
<th>Distress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>United States</td>
<td>82.4 (25.7)</td>
<td>29.1 (16.1)</td>
<td>99.8 (33.1)</td>
<td>9.7 (13.0)</td>
</tr>
<tr>
<td>France</td>
<td>75.9 (21.6)</td>
<td>28.5 (19.6)</td>
<td>124.0 (47.7)</td>
<td>12.9 (13.3)</td>
</tr>
<tr>
<td>Japan</td>
<td>64.3 (27.9)</td>
<td>22.2 (12.5)</td>
<td>105.0 (47.5)</td>
<td>16.9 (17.7)</td>
</tr>
<tr>
<td>Mean</td>
<td>74.2 (26.0)</td>
<td>26.6 (16.4)</td>
<td>109.6 (43.9)</td>
<td>13.2 (14.9)</td>
</tr>
</tbody>
</table>

regardless of her infant's activity, sum to one). Here, numerators are a subset of denominators, so the distributions can be assumed more or less multivariate normal, and therefore permit the use of parametric tests (Armitage & Berry, 1987). A one-way MANOVA was used to compare relative proportions of the four main response types across cultures, $F(8,132) = 4.72$, $p < .001$. Univariate analyses indicated that this result is ascribable to the effects of culture on extradyadic responsiveness, $F(2,69) = 8.23$, $p < .001$, and on dyadic responsiveness, $F(2,69) = 7.84$, $p < .001$; but, in the latter comparisons the proportions are low. In both cases, U.S. and Japanese proportions were significantly higher than French.

The interaction of interest was explored via the analysis of differences: Thus, each mother's proportion of dyadic responsiveness was subtracted from her proportion of extradyadic responsiveness and the differences analyzed using one-way ANOVA. The a in the pairwise comparison of differences was controlled at <.05 using the Newman-Keuls range test. The culture x extradyadic/dyadic interaction was significant, $F(2,71) = 5.13$, $p < .01$. Subsequent pairwise analyses showed that this interaction was significant for U.S./France and U.S./Japan comparisons. In part, this result is ascribable to the main effect of culture on extradyadic responsiveness noted above: U.S. proportions were significantly higher than French or Japanese. Since the U.S./Japan interaction is a crossover, the interaction cannot be explained solely as a main effect of culture.

Mothers in the three cultures did not differ in their proportions of nurturant or imitative response types. Maternal imitation was coded only with respect to infant vocalization. Thus, in computing proportions for responsiveness, imitation may be underestimated (i.e., it is not given as many opportunities to occur as the other response types). This limitation did not bias cross-cultural comparisons, however, because infants in the three societies displayed statistically equivalent base rates of vocalization.

**Maternal responsiveness to specific infant activities.**—Overall maternal responsiveness to specific infant activities was evaluated. To do this, each mother's total number of responses to a specific infant behavior was divided by the base rate for that behavior. In this way, maternal responsiveness to each infant behavior was controlled for the frequency of occurrence of that behavior. At this level of analysis, no

TABLE 2
PROPORTION OF MATERNAL RESPONSE TYPES FOR THREE CULTURES

<table>
<thead>
<tr>
<th></th>
<th>Extradyadic</th>
<th>Dyadic</th>
<th>Nurturant</th>
<th>Imitative</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>United States</td>
<td>.26 (.20)</td>
<td>.04 (.06)</td>
<td>.02 (.03)</td>
<td>.18 (.15)</td>
<td>.50 (.18)</td>
</tr>
<tr>
<td>France</td>
<td>.06 (.08)</td>
<td>.00 (.01)</td>
<td>.02 (.03)</td>
<td>.17 (.17)</td>
<td>.75 (.17)</td>
</tr>
<tr>
<td>Japan</td>
<td>.14 (.21)</td>
<td>.06 (.06)</td>
<td>.03 (.05)</td>
<td>.19 (.15)</td>
<td>.59 (.19)</td>
</tr>
<tr>
<td>Mean</td>
<td>.15 (.19)</td>
<td>.03 (.05)</td>
<td>.02 (.04)</td>
<td>.18 (.16)</td>
<td>.61 (.21)</td>
</tr>
</tbody>
</table>
TABLE 3
RATIO OF MATERNAL RESPONSES TO SPECIFIC INFANT ACTIVITIES FOR THREE CULTURES

<table>
<thead>
<tr>
<th>Culture</th>
<th>Extradyadic Attention</th>
<th>Dyadic Attention</th>
<th>Vocalization Nondistress</th>
<th>Vocalization Distress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD) Rank</td>
<td>M (SD) Rank</td>
<td>M (SD) Rank</td>
<td>M (SD) Rank</td>
</tr>
<tr>
<td>United States</td>
<td>.12 (.09) 49.7</td>
<td>.20 (.21) 29.0</td>
<td>.31 (.23) 36.6</td>
<td>.48 (.31) 37.8</td>
</tr>
<tr>
<td>France</td>
<td>.03 (.03) 25.7</td>
<td>.20 (.24) 26.1</td>
<td>.29 (.15) 36.0</td>
<td>.37 (.27) 32.8</td>
</tr>
<tr>
<td>Japan</td>
<td>.08 (.10) 34.2</td>
<td>.54 (.32) 52.5</td>
<td>.36 (.31) 36.9</td>
<td>.31 (.28) 27.9</td>
</tr>
<tr>
<td>Mean</td>
<td>.08 (.09) .32 (.30)</td>
<td>.32 (.24)</td>
<td>.32 (.24)</td>
<td>.38 (.29)</td>
</tr>
</tbody>
</table>

distinction is made among the different types of responses; thus, other responses are included in mothers' overall responsiveness.

Table 3 displays ratios for mothers' responding to each of the four kinds of infant activities. The numerator and denominator of this ratio come from different populations, and so their distributions can be expected to differ substantially from multivariate normality (Armitage & Berry, 1987). Consequently, maternal responses to specific infant behaviors were compared across cultures using the nonparametric Kruskal-Wallis (Siegel, 1956) one-way ANOVA. Also displayed in Table 3 is the average ranking of mothers in each culture relative to the total sample. Kruskal-Wallis analyses for the culture main effect were conducted on these ranks. Where the omnibus Kruskal-Wallis proved significant, pairwise comparisons between cultures were conducted using a Mann-Whitney U test for independent samples (Siegel, 1956). Allowing for a Type I error of .05 for each orthogonal comparison, a modified Bonferroni test was used to control for additional nonorthogonal comparisons (Keppel, 1982). Interactions within visual and vocal channels were tested by differencing pairs of ratios of interest and comparing the ranked differences across cultures using the Kruskal-Wallis test. As before, where the overall Kruskal-Wallis proved significant, error in pairwise comparisons was controlled using a modified Bonferroni test.

Kruskal-Wallis for the country \times within-channel difference was significant, \( \chi^2(2) = 26.13, p < .001 \). Pairwise comparisons using the Mann-Whitney test showed significant interactions for the Japan/U.S. and Japan/France comparisons; \( U's = 63.0 \) and 90.5, respectively, \( p's < .001 \). In part, these interactions are ascribable to the Japanese displaying significantly higher ratios of responsiveness to their infants' looking dyadic relative to U.S. and French mothers, \( U's = 90.5 \) and 78.5, respectively, \( p's < .001 \). Since the U.S./Japan \times visual channel interaction is a crossover, it cannot be explained as an artifact of scaling (i.e., the result of a single main effect in conjunction with a floor or ceiling effect). No significant main effects or interactions were found within the vocal channel.

Maternal response types by infant target activities.—The specificity of mothers responding to separate infant activities was also evaluated: Given a particular infant behavior, we examined the types and degrees of maternal responsiveness to that behavior. To do this, the frequency of each mother's response type to the particular infant activity examined was divided by her total responsiveness to that activity (e.g., the frequency of response type extradyadic to infant extradyadic activity was divided by the frequency of all response types to infant extradyadic activity). These proportions indicate the degree to which mothers respond in different ways to particular behaviors in their infants (Tables 4A to 4D). Main effects of culture emerged in mothers' responses to infant extradyadic and dyadic attention allocation and to infant vocalizing nondistress, \( F(6,112) = 2.28, F(6,124) = 4.73, \) and \( F(8,130) = 2.57, \) respectively, \( p's < .05 \). For the pairwise comparisons: (1) Table 4A shows that U.S. and Japanese mothers display higher proportions of coded extradyadic responses to their infants' looking at the environment than French mothers. (2) Table 4B shows that U.S. mothers have higher proportions of coded extradyadic responses to their infants' dyadic activities than French or Japanese mothers. There was also a significant crossover interaction of culture \( \times \)
extradyadic/dyadic to infants' dyadic activity, $F(2,66) = 4.96, p < .01$: U.S. mothers display higher proportions of extradyadic response types and lower proportions of dyadic response types, whereas Japanese mothers show the reverse. (3) Table 4B also shows that U.S. and Japanese mothers have higher proportions of coded dyadic responses to their infants' dyadic activities than French mothers. (4) Table 4C shows that U.S. mothers are more likely to display coded dyadic responses to their infants' vocalizing nondistress than French mothers, but these proportions are low. No significant results emerged from the analysis of mothers' responses to infant vocalizing distress.
The chief purposes of this study were to examine and compare varieties of maternal responsiveness to young infants in different cultures. The results point to several areas of cultural similarity in infant activity and in maternal responsiveness. First, the activity and responsiveness codes were originally developed in an American setting. The consistency and face validity of the pattern of findings resulting from their cross-cultural application give evidence of the generalizability of these codes to other culturally contrasting settings. Second, infants in different cultures generally look to the world and at their mothers, and they vocalize nondistress and distress, respectively, at statistically equivalent rates. Infants also look more at the world than at their mothers, and they vocalize nondistress more than distress—at least under the behavioral definitions and home-based naturalistic circumstances we observed (see, too, Bornstein & Ludemann, 1989; Bornstein & Tamis-LeMonda, 1990; Fogel et al., 1988). Third, as expected, mothers are relatively more responsive to their infants’ vocalizing than to their infants’ looking; they are equivalently responsive to their infants’ vocal signals and dyadic attentiveness; and they are equally sensitive to their infants’ nondistress and distress vocalizing, but, as anticipated, they are more sensitive to their infants’ looking at them than at the environment. That is, in confirmation of our expectations, mothers appear less “free to vary” when responding to infant vocal nondistress or vocal distress, whereas cultural variation in responsiveness tends to occur in infant looking. Across cultures, mothers also respond with nurturance equally, and they respond with imitation equally, as predicted. Notably, a high degree of shared specificity and appropriateness between infant activity and maternal responsiveness emerged in these cultures. Mothers respond to their infants’ exploration of the environment with encouragement to the environment, to their infants’ vocalizing nondistress with imitation, and to their infants’ vocalizing distress with nurturance. In short, mother and infant activity patterns appear to influence one another in a bidirectional manner: Specific maternal behaviors are keyed to specific infant behaviors and, presumably, vice-versa (Bornstein, 1989c; Bornstein & Tamis-LeMonda, 1990; Hunt, 1979, 1986; Wachs & Chan, 1986).

In parallel with this mother-infant specificity, among the four types of responsiveness we focused on, mothers respond most with imitation, more with extradyadic than with dyadic actions, and least with nurturance. In addition, a relatively large cumulative proportion of first maternal responses falls into the other category: Mothers in all of these cultures are alike in frequently responding to diverse infant activities with verbal exclamations or affirmations, noncontent and automatic utterances, questions, and nonimitative babbling or other intelligible or unintelligible sounds to babies.

Infants in the three cultures behaved at essentially similar rates in each of the four activity categories, providing similar “starting points” for mothers in the three cultures. Certain forms of maternal responsiveness to these infant behaviors were similar, as noted; but certain forms also varied across these cultures. Notably, American mothers more often respond extradyadically to their infants’ dyadic or extradyadic overtures—directing their infant’s attention to properties, objects, or events in the environment. French mothers tend to favor most the category of other response types, Japanese mothers are more responsive than are American or French mothers to social looking by their infants, and Japanese mothers respond more dyadically than extradyadically to their infant’s social looking.

Several sources of variation could account for these cultural differences in maternal responsiveness. Systematic differences in infant behavior could be responsible, at least in part, for some. All of our analyses of mother-dependent variables used proportions, however, and so either control for, or are independent of, infant activity levels. Differences in maternal responsiveness could also arise if infants were in different states of alertness, or if mothers in these cultures spent different amounts of the observation period in the company of their infants. The times mothers and babies were observed were selected to provide for favorable assessment conditions of interaction in terms of babies’ state, however, and babies in the three cultures were observed to be in equivalent and high states of alertness throughout the course of the observations. To test the maternal availability hypothesis,
we reevaluated all of the videotapes for the total duration of the session mothers actually spent with their babies. Mothers in the three cultures were in the visual presence of their babies equivalent amounts of time. We also attempted to "equate" mothers who participated in this study on sociodemographic factors like age, parity, SES, as well as years of education, and so cultural variation cannot readily be ascribed to differences in these maternal variables. Factors external to child-rearing style per se could play a part in conditioning activities of mothers with their infants, and some specific ones—prominently differing physical layouts of homes in different cultures or urban-rural locale—could conceivably influence maternal responsiveness differentially. In several respects, however, this New York City–Paris–Tokyo comparison overcomes these potential shortcomings. Participating families lived in comparable spaces, usually apartments in multistory buildings. Moreover, these three cities are among the most cosmopolitan metropolitan areas in the world. Taken together, therefore, these considerations tend to diminish the possibility that differences in responsiveness among mothers can be ascribed to differences in infant behavior, infant state, maternal availability, maternal sociodemographic status, structural differences in dwellings, or geographic location.

The results give evidence of culture universals as well as culture-specific differences in responsiveness of American, French, and Japanese mothers. It would also appear that maternal responsiveness is a differentiated, culturally sensitive format of parenting, and that noteworthy cultural differences are present in the more refined components of responsiveness. Importantly, the French pattern of responding serves as a check on any facile deductions about West–East differences in maternal responsiveness based on the United States–Japan comparison. Perhaps, cultural variation in child-rearing philosophy, values, and beliefs mediate differences in child-rearing responsiveness practices. In pursuing this possibility, we are interviewing mothers in the three locations directly about their goals for their infants, their sense of responsibility and their beliefs about their own role in helping their infants reach those goals, as well as about their understanding of the meaningfulness and effect responsiveness and other parental actions exert over development. Perhaps, for example, French mothers provide their babies with particular kinds of emotional support using other responses, or perhaps initial other responses are for them presumptive of the later use of the substantive types of responses coded here. As D'Andrade (1986, p. 117) observed: "To understand people, one needs to understand what leads them to act as they do; to understand what leads them to act as they do, one needs to know their goals; to understand their goals, one needs to understand the overall interpretive system they have that triggers these goals."

It is important to note that the samples studied in these countries were comparatively restricted in terms of sociodemographic level, urban location, and educational achievement. These restrictions aided the comparisons we undertook, since the three samples were similar on these SES variables; however, these restrictions also have implications for the generalizability of the findings in the sense that different results could emerge in samples from other regions of the SES scale, from less metropolitan environments, or from less educated families. Moreover, we concentrated these analyses on selected individual infant activities and types of mother responses occurring in open interactions; analyses of other infant behaviors or simultaneously occurring pairs of infant behaviors, and analyses of other kinds of responses in mothers, may result in similar or different patterns of findings.

The part parental responsiveness plays in child growth can be viewed profitably in the context of a contemporary effectance model (e.g., Bornstein & Lamb, 1992; Lewis & Goldberg, 1969; Watson, 1985). In this view of responsiveness, infants whose actions elicit caregivers' reactions might learn the deeper lesson that their behaviors can exert an effect on the environment and therefore that they are able to control some of their own experiences. In this connection, the various types of maternal responsiveness we studied—including extradyadic, dyadic, imitative, and nurturant—and the balance between them and other responses warrant comment. The meaningfulness of responses must be separated from their frequency, as there may be frequent or infrequent meaningless responses, just as there may be frequent or infrequent meaningful responses. Other-type responses appeared frequently as temporally first in mothers' repertoires; they may or may not be meaningful, however. On the one hand, they may exert little effect on development because they may
possess little or no meaning in the phenomenology of the infant. Alternatively, the mere occurrence of maternal responding—whatever its nature—may play a role in development, insofar as maternal responding serves notice to the infant that mother is attending (a key part of learning about interaction, intentionality, causation, and the like is figuring out when your partner is attending to or has been affected by your behavior), serves to maintain infant attention and continue the interaction, and so forth (Bornstein & Lamb, 1992; Cohn & Tronick, 1987; Martin, 1989; Stern, 1985). By the same token, the fact that the certain substantive categories of responsiveness occurred less frequently does not necessarily undercut their meaningfulness. Mothers in our study responded in ways that matched their infants' activities, and the particular categories of responsive maternal behavior we coded play key roles in the postinfancy development of a wide variety of cognitive, communicative, emotional, and social domains of functioning. Consistent, if infrequent, experience with substantive maternal responses that promote or confirm "attuned" interactions could portend as much or more for child growth and development as more frequent experience with other less substantive maternal responses. Effects that explain minute quantities of variance in particular situations can account for final outcomes when those situations recur (Abelson, 1985); an implication of this observation in the developmental realm would suggest that children may follow dramatically divergent ontogenetic paths if their interactive environments—those to which they are exposed continuously—differ even slightly. On this argument, the developmental consequences of cultural variation in maternal responsiveness clearly merit further study.

References


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