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PSYCHOLOGICAL EXPERIENCES OF JAPANESE INFANTS IN THE STRANGE SITUATION

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Fifty-four 12-month-old Japanese infants and their mothers were observed in Ainsworth Strange Situation. The psychological meaning of the Strange Situation was explored by examining the associations among social referencing, fearful reactions, and attachment classifications. Social referencing and fearful reactions were coded in episode 2 of the Strange Situation and the infants were classified into the securely attached (B) and insecure-resistant (C) categories using Ainsworth's criteria. On the basis of prior research suggesting that the Strange Situation is an especially stressful experience for Japanese infants, we hypothesized that there would be no significant associations between social referencing and attachment classifications among Japanese infants. In the U. S. A., social referencing in episode 2 is associated with attachment classifications but proximity seeking/maintaining is not. Different results were obtained in the present study. There were associations between fearful reactions and attachment classifications, but not between social referencing and attachment classifications. The findings indicated that a situation that was ambiguous for U. S. infants evoked fear in Japanese infants. This underscored previous findings indicating that the Strange Situation may be more stressful for Japanese infants than for their American peers. Such findings lead us to question the appropriateness of using the Strange Situation with Japanese infants.

The attachment relationships between infants and caretakers have been studied extensively in the U. S. as well as in other cultures (Ainsworth, Blehar, Waters, & Wall, 1978; Grossmann, Grossmann, Huber, & Wartner, 1981; Miyake, Chen, & Campos, 1985; Sagi, Lamb, Lewkowicz, Shoham, Dvir, & Estes, 1985). Most often, individual differences in attachment relationships have been measured using Ainsworth's Strange

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Situation procedure, which was developed in the U. S. (Ainsworth & Wittig, 1969). Cross-cultural studies using this procedure have repeatedly shown that the distribution across attachment categories—"secure," "avoidant," "resistant"—differs from that often found in the U. S., raising doubts about the validity of the Strange Situation when used outside the U. S. (Lamb, Thompson, Gardner, & Charnov, 1985). The purpose of the present paper was to investigate an association between Strange Situation behavior and social referencing in a sample of Japanese 12-month-olds and their mothers in order to examine these infants' psychological experiences in the Strange Situation.

Most research on attachment relationships has been guided by Bowlby's theory (1958, 1969, 1973). One important turning point came when Bowlby's colleague, Mary Ainsworth, developed the Strange Situation procedure (Ainsworth & Wittig, 1969) to assess the security of infant attachment based on Bowlby's attachment theory. In this 20-minute procedure, the level of stress is gradually increased by taking an infant into an unfamiliar room, introducing a female stranger, and engineering separations from and reunions with the mother. Using this procedure, researchers can classify the security of the infant's attachment into one of three groups depending on the patterning of the infant's attachment behavior: insecure-avoidant (A), secure (B), and insecure-resistant (C) (Ainsworth et al., 1978). In the U. S., the distribution across the B, A, and C categories is about 65%, 22%, and 13% respectively (Ainsworth et al., 1978).

Because the Strange Situation procedure provides a remarkably simple, brief, and systematic way of assessing the security of infant-mother attachment, several researchers have used it in cultures other than the U. S. In many cases, researchers have found a distribution across attachment categories that differs from the "typical" American distribution. In an Israeli kibbutz sample, for example, a high percentage (33%) of infants were classified in the C category (Sagi et al., 1985); in northern Germany, a high percentage (49%) of A classifications was reported (Grossmann et al., 1981); and in Japan, there was a high percentage (around 25%) of C classifications, with no infants in the A category (Miyake & Chen, 1985; Miyake, Chen, & Campos, 1985). These culturally-variable distributions across attachment categories are different not only from the "normative" distribution obtained in the U. S., but also from one another (Lamb et al., 1985).

Many investigators have wondered whether the unusual frequency with which "insecure" patterns were observed outside the U. S. indeed reflected insecure adaptations and presaged suboptimal development, as do "insecure" patterns in the U. S. (Ainsworth et al., 1978; Lamb et al., 1985). The appropriateness of the Strange Situation for assessing the quality of attachment outside the U. S. has thus been argued by several researchers. Grossmann, Grossmann, Spangler, Suess, and Unzner (1985) explained the high proportion of infants in the avoidant category by reference to the characteristics of north German culture; independence is encouraged and close bodily contact is thought to spoil infants. Sagi et al. (1985) attributed the high proportion of C-group infants in the Israeli kibbutz sample to specific aspects of kibbutz rearing practices or to cultural differences in temperament or emotionality.

In the case of Japanese infants, the Japanese indulge children greatly and believe that it is harmful to leave infants alone; "independence" is not valued as highly in Japan

as in the West (Kojima, 1986a, 1986b). Infants are assumed to be very dependent creatures, and mothers hardly ever leave them alone or with babysitters. At night, babies sleep in the same room as their parents. They remain close to their mothers almost 24 hours a day (see Caudill & Weinstein, 1969; Stevenson, Azuma, & Hakuta, 1986, for further details). It is clear that the typical Japanese infants' experiences, especially those involving interactions with mothers, are quite different from those of typical Western infants. The purpose of the Strange Situation was to induce "mild" levels of stress comparable to those experienced in the infants' everyday lives. Clearly, the daily life of Japanese infants is different, and does not include many separations from mothers, and thus Japanese infants may not possess the skills necessary to cope with such stresses. One goal of Japanese child-rearing practices is to minimize the stress experienced by infants (Caudill & Weinstein, 1969).

The data obtained in different cultures suggest that the psychological meaning of behaviors observed in the Strange Situation depends on the cultural context (Lamb et al., 1985). The main purpose of this study was to investigate the psychological meaning of the Strange Situation for Japanese infants by observing their social referencing behavior in episode 2 of the Strange Situation, which comprises three 1-minute segments: the stranger enters and sits next the mother quietly, the stranger talks to the mother, and the stranger plays with the infant. Social referencing by American infants appears to be associated with their patterns of Strange Situation behavior (Dickstein, Thompson, Estes, Malkin, & Lamb, 1984), so the present study investigated the same association with Japanese infants.

Social referencing involves the tendency to seek emotional information from a significant other person through visual and auditory means and use that information to appraise an event that is otherwise ambiguous (Campos & Stenberg, 1981; Feinman, 1982; Klinnert, Campos, Sorce, Emde, & Svejda, 1983). For example, 12-month-old infants will play with novel toys and cross the deep side of a visual cliff when their mothers are smiling, but will not do so when their mothers look frightened (Klinnert, 1984; Sorce, Emde, Campos, & Klinnert, 1985). The mothers' emotional communication to 10- and 12-month-olds regarding a stranger's approach also influences the quality of the infants' reaction to the stranger (Feinman & Lewis, 1983; Feinman, Roberts, & Morissette, 1986). On the other hand, if the situation is clearly pleasant or frightening, infants tend not to engage in referencing (Sorce et al., 1985) and/or they are not affected by their mothers' emotional displays (Gunnar & Stone, 1984). Importantly, Proximity seeking is more likely to occur when the situation is fear-provoking (Gunnar & Stone, 1984).

From the above studies, it is clear that mothers not only serve as "secure bases," but also as "bases of information," influencing the infants' appraisal of uncertainty. Thus, it is natural for researchers to question whether or not there are subtle differences in social referencing based on individual differences in the history of the relationship between mother and infant. Indeed, Dickstein et al. (1984) found that patterns of referencing behavior varied across Strange Situation classifications: C-group infants referenced their mothers the most, A-group infants referenced them the least, and B-group infants referenced them an intermediate amount. These differences in social referencing appeared to be consistent with the underlying nature of infants in each group. "Insecure-

resistant" or C-group infants' ambivalent nature and inability to use their mothers as sources of quick and certain reassurance seemed to heighten referencing behavior, whereas the "insecure-avoidant" or A-group infants' general tendency to ignore their mothers seemed to influence their referencing style accordingly. The secure infants' referencing style predictably fell between that of infants in these two insecure groups. Moreover, there was no association between proximity seeking/maintaining and attachment classifications. Actually, the majority of infants did not seek proximity to their mothers during episode 2. In sum, Dickstein et al. demonstrated that "security of attachment" as assessed in the Strange Situation may meaningfully relate to other aspects of infant socio-emotional development.

If there are associations between social referencing and attachment classifications with Japanese infants as in the study of Dickstein et al. (1984), this result would provide evidence for the validity of the Strange Situation assessment procedure in Japan. If Japanese infants do not engage in social referencing but appear fearful, however, this would support claims that the Strange Situation is not appropriate for Japanese infants. Because previous researchers (Miyake, Chen, & Campos, 1985; Ujiie & Chen, 1985) suggest that the Strange Situation may be more stressful for Japanese infants, the main hypothesis was that there would be no associations between attachment classifications and social referencing among Japanese infants.

METHODS

Subjects

The subjects were 60 pairs of 12-month-old (range=11:17 to 13:11 months) healthy first-born infants (31 boys and 29 girls) and their mothers, all participating in two longitudinal projects (Miyake, 1986; Miyake & Chen, 1985; Miyake, Chen, & Campos, 1985). The infants were from two-parent and predominantly middle-class nuclear families, living in the northern metropolitan city of Sapporo, Japan. The fathers were engaged in white collar or professional occupations, and the mothers were full-time primary careproviders who did not plan to work outside the home. Both parents had at least a high school education.

Procedure

Infant-mother attachment.—Each mother-infant dyad was seen and videotaped in Ainsworth's Strange Situation at 12 months (see Table 1). *Attachment classifications* were based on behaviors in episodes 3 through 7. The coders responsible for the attachment classifications did not view episode 2, whereas those who coded social referencing and fear reactions viewed episode 2 only. In this manner, we were able to ensure independence between the two types of measures. Attachment classifications were performed by our coders independently from Miyake and his colleague, following Ainsworth's instructions (Ainsworth et al., 1978). Some of our classifications were found to be different from the original ratings by Miyake and his colleagues, and the restriction of our coders focus to episodes 3 through 7 may have been responsible for these differences. There was 89% agreement between two independent coders based on 17% of the full sample.

Social referencing measures.—The social referencing measures were obtained in

TABLE 1
Summary of Episodes in the Strange Situation

Episode	Persons	Duration	Brief Description
1	Mother and Baby	3 min.	Mother (M) sits quietly while baby (B) explores.
2	Stranger, Mother, and Baby	3 min.	Stranger (S) enters. First minute: S silent. Second minute: S converses with M. Third minute: S approaches B. After 3 min. M leaves unobtrusively.
3	Stranger and Baby	3 min. ^a	First separation. S's behavior is geared to that of B.
4	Mother and Baby	3 min. or longer ^b	First reunion. M greets and/or comforts B, then tries to settle him or her again in play. M then leaves saying "bye-bye."
5	Baby alone	3 min. or less ^a	Second separation.
6	Stranger and Baby	3 min. or less ^a	Continuation of second separation. S enters and gears her behavior to that of B.
7	Mother and Baby	3 min.	Second reunion. M enters, greets B, then picks up B. Meanwhile S leaves unobtrusively.

^a: Episode is curtailed if the baby is unduly distressed.

^b: Episode is prolonged if more time is required for the baby to become re-involved in play.

Note: Fuller description is provided by Ainsworth et al. (1978).

episode 2. *Maternal referencing, proximity to mother, touching, and fussing/crying* were assessed in episode 2 of the Strange Situation, during which an unfamiliar female adult joins mother and infant in the playroom. For the first minute of this episode, the stranger sat quietly and spoke to neither infant nor mother. During the second minute the stranger conversed with mother but did not engage the infant. Finally, in the third minute, the stranger treated the infant in an increasingly friendly manner. *Maternal referencing* was a frequency measure and was coded when the infant looked at the mother directly after looking at the stranger. To index *fearful reactions*, the following measures were employed: *proximity to mother* was scored when the infant stayed within 1m of the mother without touching her. *Touching* was scored when the infant touched the mother, her clothing, or objects which she was holding. *Touching, proximity to mother, and fussing/crying* were measured by their duration in seconds in each minute of episode 2. Seventy-one percent of the subjects were coded by two independent coders. Reliability was calculated using Pearson correlation coefficients and all four measures were reliably coded: maternal referencing, .87; proximity to mother, .94; touching, .97; fussing/crying, .99.

RESULTS

Preliminary analyses

For attachment classifications, 42 infants (75%) were classified in the B-group, 12 (21%) were in the C-group, 2 (4%) were unclassifiable, and data were missing for 4 due to damaged video tapes. The unclassifiables did not fit any of Ainsworth's categories.

Because the number is small, the unclassifiables were excluded from the analyses. No infants were classified in the avoidant (A) category. There were no sex differences on any of the measures, and thus sex differences are not discussed in this report.

Thirty-eight of 54 infants (70%) engaged in maternal referencing in episode 2. Table 2 presents data concerning the frequencies of maternal referencing in the three phases of episode 2. Although there was no significant difference between the first and second minutes, referencing was significantly more frequent in the second than in the third minutes, $t(53)=4.95$, $p<.001$. Infants who referenced frequently during the first minute were also likely to reference frequently during the second minute, $r=.40$, $p<.001$. Similarly, infants who referenced frequently during the second minute also tended to reference frequently during the third minute, $r=.21$, $p<.06$. The reduced incidence of referencing in the third minute is probably attributable to the fact that the stranger became friendly and engaged in play with the infant during this segment.

Twenty-six percent ($n=14$) of the subjects sought proximity to their mothers without touching, 61% ($n=33$) touched their mothers, and 17% ($n=9$) fussed and cried sometime during the episode. Mean levels of these measures are presented in Table 3. A t -test revealed no differences between means for the 3 minutes on the proximity measure, whereas the infants were more likely to touch their mothers in the second than in either the first, $t(53)=3.15$, $p<.01$, or the third, $t(53)=1.95$, $p<.06$, minute. No differences were found between means for fussing/crying either. Pearson correlations revealed no significant stability over time in proximity seeking, but levels of touching were highly stable from the first to the second minute, $r=.76$, $p<.001$, and from the second to the third minute, $r=.67$, $p<.001$, indicating that infants who touched in the first minute continued to do so in the second and third minutes. Fussing/crying also revealed high stability from the first to second minute, $r=.66$, $p<.001$, and from the second to the third minute, $r=.39$, $p<.002$, also indicating that infants who fussed and cried in the first minute continued to do so in the second and third minutes.

The associations between maternal referencing and fear reactions were tested using Spearman correlations (see Table 4). No significant correlations were found between maternal referencing and proximity, but there were negative correlations between referencing and touching and between referencing and fussing/crying. Infants who referenced the most were those who stayed away from their mothers the longest or did not touch their

TABLE 2
Mean Frequencies of Maternal Referencing: Japanese and American Samples

	Minute		
	1	2	3
Japanese			
Means	.98	1.33	.15
SD	1.04	1.80	.34
American*			
Means	2.47	1.98	.49

* Dickstein et al. (1984).

TABLE 3
Means, Standard Deviations, and Medians for the Duration of Proximity, Touching, and Fussing/Crying

	Minute		
	1	2	3
Proximity			
Means	3.19	2.80	2.56
SD	1.33	1.22	1.22
Median	0	0	0
Touching			
Means	14.96	22.35	16.87
SD	3.08	3.56	3.37
Median	0	4.0	0
Fussing/Crying			
Means	1.31	2.46	9.58
SD	.18	.34	1.30
Median	0	0	0

TABLE 4
Correlations between Maternal Referencing and Touching

Minute	Maternal Referencing		
	1	2	3
Touching	1	-.50***	
	2	-.34**	-.51***
	3	-.34**	-.49***
Fussing/Crying	1	-.26*	
	2	-.21	-.19
	3	-.10	-.21

*: $p < .05$ ** : $p < .01$ ***: $p < .001$

mothers at all, and those who did not fuss and cry. Moreover, there were significant negative correlations between the frequency of maternal referencing in the first minute and the amount of touching in the second and third minutes, as well as between referencing in the second minute and touching in the third. These results indicated that these infants' psychological experience (i. e., appraising the situation as being fearful) in the first and second minutes influenced their later behavior (i. e., touching their mothers) in the second and third minutes.

Association with Attachment Classifications

To test the hypothesis that there would be no association between attachment classifications and maternal referencing, a 3 (minutes: 1, 2, 3) by 2 (attachment classifications: B, C) repeated measure ANOVA was conducted (Table 5). There were no significant main effects for attachment classifications, $F(1, 52) = 1.25$, $p < .268$, but there was a significant main effect for minutes, $F(2, 104) = 17.07$, $p < .001$. There was no

significant interaction between the factors, $F(2, 104) = 1.18, p < .333$. These results confirmed our hypothesis that no association between attachment classifications and maternal referencing was found, and this was inconsistent with the results reported by Dickstein et al. (1984).

Associations between Attachment Classifications and Fearfulness

It was predicted that infants who felt fearful in episode 2 would appear more anxious with their mothers and thus be classified as insecurely attached. This possibility was tested using 2 (attachment classifications: B, C) by 2 (fear reactions: yes, no) Fisher Exact Probability tests (see Table 6). No significant associations were found between attachment classifications and proximity seeking or between attachment classifications and fussing/crying, whereas a significant association was found between attachment classification and touching. The C-group infants were more likely than the B-group infants to touch their mothers.

DISCUSSION

The present results supported the hypothesis that there would be no association

TABLE 5
Means and Standard Deviations of Maternal Referencing by Attachment Classifications

		Minute		
		1	2	3
Attachment Classifications	B			
	Means	1.00	1.50	.17
	SD	1.06	1.85	.38
	C			
	Means	.92	.75	.08
	SD	1.00	1.55	.29

TABLE 6
Associations between Attachment Classifications and Proximity, Touching, and Fussing/Crying

		Attachment Classifications	
		B	C
Proximity Seeking	Yes	10	4
	No	32	8
Touching*	Yes	22	11
	No	20	1
Fussing/Crying	Yes	5	4
	No	31	8

Note: A Fisher Exact test revealed a significant group effect ($p = .012$) for touching, but there were no significant differences on any other measures.

between attachment classifications and social referencing among Japanese infants. Instead, fearful reactions were displayed by the majority of infants and group differences were also found such that C-group infants were more likely than B-group infants to touch their mothers, perhaps because the C-group infants were more anxious.

In this study, the incidence of social referencing in episode 2 of the Strange Situation was used to examine whether the Strange Situation procedure had the same meaning for Japanese and American infants. In the U. S., C-group infants referenced more frequently than B- and A-group infants. However, this association was not found in the Japanese sample. Furthermore, the American infants in the study of Dickstein et al. (1984) referenced their mothers roughly twice as frequently as Japanese babies in each minute.

A review of sample Japanese and American tapes suggested one reason for this: Episode 2 was not ambiguous for many of these Japanese infants. Gunnar and Stone (1984) demonstrated that infants were not affected by expressive maternal displays if a toy was not ambiguous, although they engaged in social referencing nonetheless. Similarly, Zabatany and Lamb (1985) found that infants who considered a toy spider frightening when they were initially introduced to it seemed to look at the adult for confirmation of their fear rather than for disambiguation of the toy. These Japanese infants may have referenced their mothers not because episode 2 was ambiguous, but because they needed to check their mothers to confirm their appraisal of the situation as frightening. Actually, those infants who referenced little or not at all in the first minute were likely to maintain contact with their mothers in the second minute. These infants seemed to find the first minute frightening and then sought further reassurance by touching their mothers. Once infants achieve physical contact with their mothers, they do not have to reference their mothers visually any more, and this could explain why Japanese infants tended to reference less frequently than American babies who seek less proximity, especially in episode 2. Our results suggest that episode 2 was not clearly ambiguous for many of the Japanese babies. Engagement in social referencing per se might not be the best indicator of whether or not the situation was ambiguous, because subsequent behavior such as touching their mothers or not seems to indicate how the situation was appraised by the infants.

Indeed, not only did the majority of infants engage in proximity seeking/maintaining, but group differences were also found. Resistant (C-group) infants spent more time touching their mothers than securely-attached (B-group) infants. Although touching provides one way of obtaining assurance from mothers, it is more likely to occur when the situation is clearly frightening (Gunnar & Stone, 1984). Activation of proximity seeking behavior not only suggests that episode 2 was not ambiguous but also indicates that the infants were under stress. According to Bowlby (1969) and Ainsworth et al. (1978), the attachment system is generally activated when infants experience stress, whereas the exploratory system is inhibited under stress. The fact that the majority of infants in this sample stayed close to their mothers strongly suggests that the preseparation episode 2 was also stressful enough to activate the attachment system.

Ujiie and Chen (1985) and Ujiie and Miyake (1985) examined the affective states and attachment behavior of these Japanese infants in the Strange Situation. Ujiie and Miyake (1985) found that Japanese infants tended to be extremely distressed throughout the Strange Situation, and contrary to the results of Ainsworth et al. (1978), reported that

attachment behavior was activated in nearly half the sample, even before the stranger appeared and the mother left. Ujiie and Chen (1985) found that distress levels in the preseparation episodes predicted infants' attachment classifications: the more the infants were distressed in the preseparation episodes, the more likely they were to be classified in the B4 or C categories. Furthermore, for those infants who were already distressed in the preseparation episodes, the levels of stress in the separation episodes (especially the infant-alone episode) were probably too much for their available coping skills to handle. In the subsequent reunions, therefore, they could not really recover from the experience and were difficult to soothe.

The present results underscored Ujiie and Chen's (1985) point. In that study, an association was found between ratings of contact maintaining and attachment classifications. In the U. S., however, there were no significant associations between attachment classifications and contact maintaining behavior in episode 2 (Ainsworth et al., 1978; Dickstein et al., 1984). This suggests that episode 2 is already sufficiently stressful for Japanese infants to activate attachment behavior. If even the preseparation episodes were stressful, the subsequent separations may have been much too stressful and so could impair the infants' usual ability to cope with stress. Attachment theory (Ainsworth et al., 1978; Bowlby, 1969) predicts that infants would not function well under strong stress, and the Strange Situation was designed to generate mild stress (Ainsworth et al., 1978). The evidence thus leads us to question the appropriateness of using the Strange Situation with Japanese infants.

As cross-cultural data on the Strange Situation have accumulated, researchers have become cautious about inferring "insecurity" on the basis of A- or C- type behavior. For example, in Germany, Grossmann et al. (1985) doubted that their many "avoidant" infants were maladaptively attached, as might be the case if they were American infants (Ainsworth et al., 1978). Rather, they suggested that these avoidant infants had adapted to the cultural belief that children should be independent. If the many resistant infants observed in Israeli kibbutzim or in Japan were so classified as a function of the higher levels of stress produced by the Strange Situation procedure, then it would be inappropriate to interpret their "resistance" as an index of insecurity (Sagi et al., 1985; Ujiie & Chen, 1985). Likewise, the fact that our Japanese infants did not reference their mothers differently depending on their attachment classifications may reflect cultural views of resistant behavior. Specifically, if resistant infants are viewed not as resistant but as securely-attached, then the lack of group differences in referencing behavior becomes explicable. Therefore, the absence of group differences in the frequency of referencing might in part occur because infants who would have been in the A- or B-groups if the procedure were culturally appropriate were inappropriately assigned to the C-group.

The present study provided further support that the Strange Situation may be a more stressful experience for Japanese infants than for American infants. If the Strange Situation is differently experienced by Japanese infants, researchers should use caution when interpreting the meaning and implications of Strange Situation behavior in Japanese infants.

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