Primary Appraisal of the Strange Situation
A Cross-Cultural Analysis of Preseparation Episodes

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ABSTRACT

Studies in various countries–among them Germany, Holland, Israel, Japan, Sweden, and the United States–have reported Strange Situation distributions that differ markedly across and within cultures, thus raising doubts as to whether infant behavior in the Strange Situation can be regarded as a valid index of the security of attachment, at least in a cross-cultural context. It is proposed here that a fuller understanding of infant behavior in the Strange Situation requires an assessment of what Connell and Goldsmith (1982) have referred to as the infant's primary appraisal of this procedure. A cross-national comparison of data from seven laboratories ($N = 498$) was carried out in order to determine (a) whether the preseparation episodes made any difference in attachment classifications and (b) whether infant behavior in different countries was indeed the same before separation from the mother. Furthermore, procedural variations have been taken into account. Using multivariate discriminant function techniques, information obtained during preseparation episodes was found to discriminate between attachment classifications. At the same time, however, in a series of multivariate analyses of variance, a relatively small number of cross-cultural differences in preseparation behavior were found. With the exception of the Israeli kibbutz and Swedish infants, our data suggest that infants in different countries make similar primary appraisals of the Strange Situation.

During the past two decades the "Strange Situation" procedure (Ainsworth & Bell, 1970) has been widely used in investigating the development of individual differences in the quality of infant—adult attachment. In consequence, it has produced most of the available data in this area (for major reviews see Bretherton, 1985 ; Lamb, Thompson, Gardner, & Charnov, 1985). Although the Strange Situation has been validated in the United States (Ainsworth, Blehar, Waters, & Wall, 1978), the procedure has also been applied by investigators in countries such as the former Federal Republic of Germany (Beller & Pohl, 1986 ; Grossmann, Grossmann, Huber, & Wartner, 1981), Japan (Miyake, Chen, & Campos, 1985), Sweden (Lamb, Hwang, Frodi, & Frodi, 1982), the Netherlands (Van IJzendoorn, Goossens, Kroonenberg, & Tavecchio, 1985), and Israel (Sagi, Lamb, Lewkowicz, Shoham, Dvir, & Estes, 1985). Because some of these studies seemed to show marked differences in distributions of attachment classifications from the American "standard" distribution of about 20% avoidant (A), 70% secure (B), and 10% resistant (C) to attachment relationships (Ainsworth et al., 1978), the cross-cultural utility and validity of the procedure was doubted (Kagan, 1984 ; Lamb et al., 1985).

In a meta-analysis of almost 2,000 Strange Situation classifications from 32 samples in eight countries, Van IJzendoorn and Kroonenberg (1988) showed that cross-cultural differences in attachment classification distributions were relatively modest in comparison with the intracultural differences. They concluded that the cross-cultural validity of the Strange Situation cannot be doubted only because cross-cultural sample distributions differ from the U.S. standard. Nevertheless, the global trend in cross-cultural differences suggested greater relative frequencies of A classifications in Western European countries and C classifications in Israel and Japan (Van IJzendoorn & Kroonenberg, 1988). In order to explain the relatively small cross-cultural differences, as well as the global trend, it is necessary to go beyond mere differences in distribution of attachment classifications (Grossmann & Grossmann, 1990) and to focus on the quality of infants' interactive behavior in the Strange Situation. As Ainsworth and Bell (1970) emphasized, the Strange Situation has been designed to be novel enough to elicit exploratory behavior and yet not so strange that it would evoke fear at the outset. It has been suggested that the same procedure would not accomplish this delicate balance in different cultures (Lamb et al., 1985).

Here, we focus on cross-cultural differences and commonalities in the infants' primary appraisal (Connell & Goldsmith, 1982) of the Strange Situation, because it is not clear whether the procedure indeed creates, at the procedure's beginning, the same experiences of novelty and mild stress for infants in different cultures. Being exposed to a strange environment and to a strange person may elicit more fear in infants who have experienced such situations less frequently (e.g., Japanese and Israeli kibbutz infants) than in infants who are more used to being confronted with strange situations and strangers (e.g., infants from Western Europe, and especially from, the former Federal Republic of Germany where quite a few avoidant mother—infant relationships have been found). Alternatively, procedural differences may influence the primary appraisal. In some samples (e.g., in the United States, Sweden, and Israel), a stranger sociability test, which preceded the Strange Situation procedure, may have heightened the infants' fear in the preseparation episodes; in another sample (e.g., in the Bielefeld study in the former Federal Republic of Germany; Grossmann et al., 1981), the size of the playroom and the play material deviated from Ainsworth's guidelines, and this may have lowered the preseparation fear (Sagi & Lewkowicz, 1987); and in yet another sample (the Netherlands), somewhat older infants were involved, and they might have reacted less anxiously to the Strange Situation procedure. Therefore the "opening line" in the Strange Situation may not be the same for all infants, and this

circumstance may in itself bias infants' behavior in subsequent episodes, as well as bias the final attachment classifications (Sagi & Koren-Karie, 1986). Especially from the viewpoint of attachment classifications as indicators of emotionally integrated strategies for dealing with attachment figures in different circumstances (Bowlby, 1975 ; Main, 1990), one would expect that differences in primary appraisal of the Strange Situation would be coherently connected to differences in reunion behavior and thus in attachment classifications.

Along these lines, one would expect Japanese infants to exhibit more stress during the preseparation episodes, and in subsequent episodes to show more C-like behavioral patterns. This can be attributed to the specific Japanese childrearing practice of not encouraging early separations. Similarly, one would expect comparable stress in kibbutz infants but for a different reason. Kibbutz children are not frequently exposed–especially during early infancy–to unfamiliar adults outside of the kibbutz community. Contrastingly, one would anticipate German infants to exhibit less stress during preseparation episodes and to display more A-like behavioral patterns in subsequent episodes. This may be explained by the specific (northern Germany) childrearing practice of encouraging early independence.

In summary, it was hypothesized that preseparation episodes do make a difference in attachment classifications. That is, infants' primary appraisal of the Strange Situation is indeed related to their classifications. Furthermore, we expected that infants' preseparation behavior in different cultures would not be the same. More specifically, it was hypothesized that Japanese and Israeli kibbutz infants would be more anxious at the outset of the procedure because of their infrequent encounters with equivalent situations in daily life, whereas infants from different Western European countries, especially from the former Federal Republic of Germany, would appraise the Strange Situation in a less anxious way. Last, we expected the Strange Situation to be robust against procedural variations that have been introduced into cross-cultural attachment research. More specifically, it was hypothesized that the size of the playroom (the former Federal Republic of Germany, i.e., Grossmann et al., 1981), age of subjects (the Netherlands), and a stranger sociability test preceding the Strange Situation procedure (United States, Sweden, and Israel) would not be related to systematic differences in Strange Situation behavior. To address the issue of cross-cultural differences in primary appraisals as well as the influence of procedural variations, we decided to compare infants' behavior toward both the mother and the stranger during the preseparation episodes in all available samples from several different cultures rather than focus on a few previously discussed samples (i.e., Israel, Japan, and the former Federal Republic of Germany). The latter approach may have been preferred if one were only interested in cross-cultural differences.

Method

Data sets from seven laboratories in different countries were made available to us for analysis. These data sets are presented in Table 1 . A few characteristics of these samples should be described and kept in mind when making interpretations later on. This is especially relevant for a cross-cultural comparison in which different settings and subjects are used. We managed to assemble the following information. All samples were predominantly middle socioeconomic states (SES) samples with an approximately equal division of gender. Families were, for the most part, intact, and no medical problems were reported concerning mothers or infants. Some specific characteristics are as follows:

- In three samples (U.S., Israeli, and Swedish), the same researcher (Michael E. Lamb) rated the Strange Situation and trained the other raters. Also, because only reunion

episodes were used in the original analysis of the Bielefeld sample, Abraham Sagi and Nina Koren-Karie rated the preseparation episodes for the purpose of this study. Sagi was trained by Lamb, and Koren-Karie was trained by Sagi and Karin Grossmann in Germany. Therefore, with respect to the effect of rating across laboratories, the Bielefeld sample can be conceived as comparable to the U.S., Israeli, and Swedish samples. The final classifications made, in addition to ratings of preseparation episodes, perfectly matched the original classifications made by Grossmann et al., (1981) .

- Immediately prior to each Strange Situation assessment, the infants' sociability toward an unfamiliar adult was assessed in the U.S. (Thompson & Lamb, 1983), Israeli (Sagi, Lamb, & Gardner, 1986), and Swedish (Lamb et al., 1982) samples. The extent to which this procedural difference from the other samples makes a difference in primary appraisal is examined in the discussion about cross-cultural differences and commonalities.

- The higher mean age of the Dutch sample ($M = 21$) should be noted when we compare it with those of the other samples. Although the Strange Situation procedure has been successfully applied to infants as old as 2 years of age, older children might be less impressed by preseparation episodes.

- In Bielefeld, a very large playroom with many attractive play materials was used in the Strange Situation, and this was much beyond the guidelines prescribed by Ainsworth et al. (1978 , for a methodological review see Sagi & Lewkowicz, 1987) .

- The Japanese data, as reported by Miyake et al. (1985) , have gone through a number of rating revisions. In addition, the same data have been published elsewhere (Takahashi, 1986) with somewhat different results. Therefore, for the purpose of the present analysis, we have used the most recent data set provided by K. Miyake (personal communication, November 1988).

- In the kibbutz study (Sagi et al., 1985), a considerable number of sessions were either modified or terminated prematurely–either without any or after only one brief separation–because the kibbutz children were inconsolably distressed. As such, the psychological meaning of this modified Strange Situation group might have been different from the complete Strange Situation group (Oppenheim, Sagi, & Lamb, 1988 ; Sagi, 1990). Therefore, in this study and especially in our examination of cross-cultural differences, we made a differential reference to these two distinct groups and treated them as two separate subsamples. At the same time, in order to substantiate (or alternatively reject) this assumption, we made a number of preliminary comparisons between these subgroups. These comparisons appear in the subsection *Reduction of numbers of groups.* It should also be noted that in the Japanese sample, the investigators experienced a similar problem (K. Takahashi, personal communication, April 1987; Takahashi, 1986), but insufficient raw data made it impossible to take it into consideration in our analysis.

We made comparisons on all five infant—mother interactive scales: proximity seeking, contact maintaining, resistance, avoidance, and distance interaction. Because most scales in most of the episodes were not normally distributed, we logarithmically transformed the interactive scales. The mean and standard deviation of the skewness for the transformed interactive scores are 2.38 and 3.35, respectively.

Results

Primary Appraisal Hypothesis

To test the primary appraisal hypothesis, we performed three multivariate discriminant function analyses using five interactive scales as predictors of membership in one of the three attachment classification groups: A, B, or C. More specifically, the predictor variables were proximity seeking, contact maintaining, resistance, avoidance, and distance interaction to the mother in the second and third episode and to the stranger in the third episode. It should be noted here that in each of these three analyses, we combined all cross-cultural samples into one large sample. We decided to take this global approach because we wanted to find out whether, irrespective of culture, preseparation episodes did make a difference in attachment classifications. Because the number of A- and C-classified infants in each specific sample are different and usually quite small, separate discriminant analyses for every sample might yield different and inconsistent functions, thereby making the discriminant results incomparable and difficult to interpret. A global discriminant analysis on the entire sample should provide us with information that can be used as a unitary baseline in subsequent multivariate analyses of variance (MANOVAs) when making cross-cultural comparisons (see section on cross-cultural differences). Table 2 presents a summary of the discriminant analyses.

In the first discriminant analysis (with the interactive scales in Episode 2 as predictors), two discriminant functions were calculated, with a combined $\chi^2 8 = 86.32; p < .001$. After removal of the first function, there was still significant discriminating power for the second function $\chi^2 3 = 17.38; p < .001$. The two discriminant functions accounted for 81% and 19%, respectively, of the between-groups variability. From the group centroids, it can be seen that the first discriminant function maximally separated C classifications from A and B classifications. The second function discriminated B classifications from the other two groups. The standardized canonical discriminant function coefficients suggest that the primary predicting variable in distinguishing between C versus A and B classifications (first function) is resistance to the mother. Infants classified as C showed more resistance to their mothers in Episode 2 in comparison with infants classified as A and B. After adjusting for all other discriminating variables using the Huberty U index–a method recommended by Huberty (1984) for measuring the importance of each variable in a discriminant function–resistance remained the most important predictor.

Three predictors had standardized canonical discriminant function coefficients in excess of 0.30 in the second function. Avoidance to the mother most strongly contributed to this function. B-classified infants showed less avoidance in Episode 2 than did A- or C-classified infants. Distance interaction appeared to more intensely characterize B-classified infants in comparison with A- and C-classified infants, whereas A-classified infants showed less proximity seeking to their mother than did B- or C-classified infants. After adjusting for all other discriminating variables, avoidance was found to be the most important predicting variable. The squared standardized canonical discriminant function coefficients approached the Huberty's U coefficients, suggesting that each predictor uniquely contributed to the discriminant function.

The second discriminant analysis, with interactive behaviors to the mother in Episode 3 as predictors, also yielded two discriminating functions, with a combined $\chi^2 8 = 86.02, p < .001$. After removal of the contribution made by the first function, the second function also remained with a discriminating power, $\chi^2 3 = 24.57, p < .001$. The two discriminant functions accounted for 72% and 28%, respectively, of the between-groups variability. The same predictors, as in the first discriminant analysis, loaded on the discriminant functions, and they discriminated the same

classification groups. The discriminating power of the second discriminant analysis, however, was some—what less than that of the first analysis (13% vs. 18%, respectively, of above-chance correct predictions for group membership classifications, as calculated by the Huberty *I* index [Huberty, 1984]).

The third discriminant analysis, with the interactive behavior to the stranger in Episode 3 as predictors, once again yielded two discriminant functions, with a combined $\chi^2 4 = 38.67, p < .001$. After removal of the first function F_1, the second function F_2 still remained with a unique discriminating power, $\chi^2 2 1 = 8.28, p < .01$, accounting for 21% of the between-groups variability. Here, too, the first function F_1, was found to differentiate between C-classified infants and A- and B-classified infants with resistance loading on the function. Stated differently, already in Episode 3, C-classified infants showed more resistance to the stranger in comparison with A- or B-classified infants. Alternatively, distance interaction with the stranger mostly loaded on the second function F_2: B-classified infants showed more distance interaction than did A- or C-classified infants. It should also be noted here that on the basis of the Huberty *I* index, the discriminant analysis pertaining to the stranger predicted only about 6% above chance agreement of group membership. The two functions accounted for about 8% of the variance in classification.

In summary, attachment classifications appeared to be, in part, predictable from infants' behavior in preseparation episodes, suggesting the existence of differential primary appraisals of stress during earlier preseparation episodes. Resistant infants showed more resistance to their mothers in the preseparation episodes than did avoidant or secure infants, whereas secure infants sought more interaction (through proximity seeking and distance interaction) and avoided interaction with mothers less than avoidant or resistant infants did.

Cross-Cultural and Procedural Differences

Our second hypothesis suggested some cultural differences in the primary appraisal of the Strange Situation, and our third hypothesis implied the absence of systematic differences in primary appraisal because of procedural variations. Although the present analyses focused on cross-cultural differences, at the same time these analyses addressed the issue of procedural differences (see the *Discussion and Conclusion* section). To test the second and third hypotheses, we focused only on those interactive scales in the preseparation episodes that, on the basis of our prior discriminant analyses, appeared to have predictive power. Therefore we have decided to concentrate only on interactive measures that discriminated among attachment classifications for two reasons: (a) It was undesirable to include all preseparation variables because of the lower power involved in analyzing the maximum number of predictors and because of the multicollinearity problem caused by the conceptual and operational overlap between part of the variables (e.g., proximity seeking and contact maintenance). (b) In selecting preseparation variables we decided to adopt an empirical approach and to keep only those variables that appeared to be indicative of attachment classifications on the basis of pertinent discriminant function analyses. Indeed, we are aware that this approach is somewhat conservative in that we might exclude variables relevant on a priori theoretical grounds. We preferred to include only those variables that showed both theoretical and empirical relevance to attachment.

To test the hypothesis, we had to control for classification differences, because in samples consisting of a higher number of resistant infants, for example, the mean score on resistance in preseparation episodes is, by default, higher than in samples with fewer C-classified infants. Therefore, our between-countries analyses were performed within each attachment classification group separately. Also, to minimize the number of groups and to strengthen the power of our

between-cultures comparisons, we performed preliminary analyses to find out whether samples could be combined in countries with more than one sample, such as Israel and Germany.

Reduction of number of groups.

To compare the mean scores of the Israeli samples (complete kibbutz, modified kibbutz, and day care) on the interactive scales in the two preseparation episodes, we computed 18 MANOVAs. Because A classifications were absent in the modified kibbutz sample and marginal in the day-care sample, the MANOVAs were performed only on the interactive scores of B and C classifications (2 groups × 3 samples × 3 clusters of interactive scales = 18 MANOVAs). Also, to avoid a possible carryover from previous episodes to later episodes, we decided to use the Bonferonni correction for inflation of alpha level, which yielded an alpha of .003 (.05/18 comparisons).

The interactive scales in Episode 2 showed a significant MANOVA difference, $F(5, 41) = 4.36$, $p < .003$, for the comparison between the secure infants in the complete kibbutz sample and those secure infants included in the modified kibbutz sample. Interactive behaviors to the mother in Episode 3 also yielded a significant multivariate difference between the secure infants in the complete and modified samples, $F(5, 41) = 6.76$, $p < .001$. When comparing the secure modified and the secure day-care samples, a multivariate difference was found in means on the interactive behaviors to the mother in Episode 2, $F(5, 33) = 7.37$, $p < .001$. In comparing the behavior of secure infants in the complete kibbutz with that of secure infants in the day-care sample, we found a significant difference in means on interactive behavior to the mother in Episode 3, $F(5, 70) = 4.97$, $p < .001$. In contrast to the comparisons made with the secure group, no significant differences were found between the three Israeli samples within the group of resistantly attached infants. Therefore, all Israeli resistant infants from the three samples were combined into one group.

In comparing the mean scores between the two German samples (Berlin and Bielefeld) of the interactive scales in the two preseparation episodes, six MANOVAs were computed (C classifications were excluded for these comparisons because the group sizes were too small, and in subsequent analyses only Bielefeld C infants were included). The Bonferonni correction yielded an alpha level of .008 (.05/6 comparisons). Whereas comparisons within the avoidant—attached group did not yield significant differences, comparisons within the securely attached group were found to have one significant effect for the interactive scales in Episode 2, $F(5, 44) = 3.59$, $p < .008$. Therefore, only the German avoidant infants were combined into one group for the purpose of further cross-cultural comparisons. It should also be noted that because of unequal sample sizes, we have selected to report the more conservative values of *Pillais* (Tabachnik & Fidell, 1983).

A-classified infants.

For cross-cultural comparisons within the group of A-classified infants, three MANOVAs were computed, with the interactive behaviors to the mother in Episode 3, to the mother in Episode 2, and to the stranger in Episode 3 as the three sets of dependent variables. The Bonferonni corrected alpha level was .02 (.05/3). The independent variable was country, including complete kibbutz, United States, Germany, Holland, and Sweden (modified kibbutz, day care, and Japan were not included). For Episode 2, the MANOVA yielded a significant difference between the countries, *Pillais* = 0.53, $F(20, 328) = 2.52$, $p < .001$, with avoidant behavior to the mother as possibly accounting for the multivariate effect, $F(4, 83) = 8.54$, $p < .001$. The MANOVA on the interactive behaviors to the mother in Episode 3 also showed a significant difference between the countries, *Pillais* = 0.56, $F(20, 328) = 2.66$, $p < .001$, with avoidance once again contributing to

this difference, $F (4, 83) = 6.41$, $p < .001$. Lastly, the MANOVA on the interactive behaviors to the stranger in Episode 3 showed another significant effect, *Pillais* = 0.50, $F (16, 332) = 2.96$, $p < .001$. Avoidant behavior to the stranger contributed to this effect, $F (4, 83) = 12.30$, $p < .001$. Table 3 contains the means, standard deviations, and Scheffe's post hoc multiple range tests for group differences. From Table 3 , it can be seen that the Israeli and Swedish A-classified infants showed more avoidance to the mother in the two preseparation episodes than did the Dutch infants. Furthermore, the Swedish A-classified infants also showed more avoidant behavior in these preseparation episodes than did the German infants. It should be noted that avoidant behavior to the stranger is not discussed because this variable was not found to significantly predict attachment classifications.

C-classified infants.
Parallel to the MANOVAs reported for the A-classified infants, three MANOVAs were computed within the group of C-classified infants. This time the country variable consisted of Israel (combined), the United States, Bielefeld, Holland, and Japan (Berlin and Sweden were not included because their sample sizes were too small). Only the MANOVA for Episode 2 yielded a significant effect, *Pillais* = 0.62, $F (20, 240) = 2.19$, $p < .01$, with avoidant behavior to the mother contributing to this multivariate effect, $F (4, 61) = 4.42$, $p < .01$. Scheffe's post hoc multiple range test showed that Israeli resistant infants avoided their mothers more ($M = 0.10$, $SD = 0.14$) than did Japanese resistant infants $(M = 0.00)$. Because few resistant infants exhibited avoidance to their mothers, this outcome needs to be interpreted cautiously.

B-classified infants.
Here again, preliminary analyses did not provide the justification needed to unify groups within cultures. Therefore three MANOVAs were computed for the following groups: United States, Berlin, Bielefeld, Holland, Sweden, Japan, Israel (day care), Israel (modified kibbutz), and Israel (complete kibbutz). The first MANOVA for Episode 2 yielded a significant difference between countries, *Pillais* = 0.66, $F (40, 1600) = 6.05$, $p < .001$, with four out of five interactive scales contributing to this multivariate effect: proximity seeking, $F (8, 320) = 3.45$, $p < .001$; contact maintaining, $F (8, 320) = 6.56$, $p < .001$; avoidance, $F (8, 320) = 9.39$, $p < .001$; and distance interaction, $F (8, 320) = 6.23$, $p < .001$. Table 4 includes a summary of means and standard deviations as well as Scheffe's post hoc multiple range tests.

The MANOVA for the interactive behaviors with the mother in Episode 3 as dependent variables showed a significant effect, *Pillais* = 0.60, $F (40, 1600) = 5.44$, $p < .001$. Contributing to the general MANOVA effect were proximity seeking, $F (8, 320) = 5.42$, $p < .001$; contact maintaining, $F (8, 320) = 4.74$, $p < .001$; resistance, $F (8, 320) = 4.77$, $p < .001$; avoidance, $F (8, 320) = 11.23$, $p < .001$; and distance interaction, $F (8, 320) = 3.81$, $p < .001$. As with Episode 2, Table 4 contains means and standard deviations, as well as Scheffe's post hoc tests for this MANOVA. Also excluded are variables that were not deemed important in the discriminant analysis (see Table 2).

The MANOVA with the interactive behaviors to the stranger as dependent variables also showed a significant effect, *Pillais* = .26, $F (32, 1276) = 2.81$, $p < .001$, with proximity seeking, $F (8, 319) = 2.46$, $p < .05$, and avoidance, $F (8, 319) = 5.67$, $p < .001$, as contributing to this effect. Because these variables were not found to contribute to the discriminant function (Table 2), Scheffe's post hoc tests are not reported here.

Inspection of the significant contrasts for the B-classified infants suggests that in many comparisons the findings for the Israeli kibbutz samples (modified and complete) were different from those of the other samples. Kibbutz infants showed more avoidance to the mother in

Episodes 2 and 3 than did Dutch infants. Infants in the modified sample showed more avoidance to the mother than did the Berlin and the Japanese infants and, in Episode 3, the U.S. infants. Also, infants in the complete kibbutz sample showed more avoidance to the mother in Episode 3 than did the U.S., Berlin, and Japanese infants. Furthermore, in the modified kibbutz sample, infants showed more proximity seeking to the mother during Episode 3 than did infants in all the other samples, whereas infants in the complete sample showed more resistance to the mother during Episode 3 than did the Japanese and Dutch infants. In all, 23 of 36 significant contrasts involved the Israeli kibbutz samples. Thus, the kibbutz infants appeared to be more alert to stress and seemed to exhibit more preseparation anxiety than did infants in most other samples.

In the cross-cultural debate, two samples have received much attention, namely, the Bielefeld and the Japanese (e.g., see Bretherton, 1985 ; Grossmann & Grossmann, 1990 ; Lamb et al., 1985 ; Sagi, 1990 ; Sagi et al., 1987). In our contrast analyses on the secure groups, however, the Bielefeld sample only once appeared to be in a specific position: Infants showed less proximity seeking to the mother in Episode 2 than did the U.S. infants. The Japanese sample almost always was in the same position as the Dutch and Berlin samples by showing less avoidance than the Israeli kibbutz or the Swedish infants. Similar to the Dutch sample, Japanese infants showed less resistance to the mother in Episode 3. The only contrast that isolated the Japanese sample from the other samples was distance interaction to the mother in Episode 2; Japanese infants appeared to show less distance interaction. Alternatively, although the Swedish sample did not seem to have specific cross-cultural characteristics (Lamb et al., 1985), in our analysis nine contrasts involved this sample. Secure Swedish infants showed more avoidance to the mother than did Berlin, Dutch, and Japanese infants in Episodes 2 and 3 and more avoidance to the mother in Episode 3 than did U.S. infants. Furthermore, these infants showed more distance interaction than did Japanese infants (in Episode 2) and Dutch infants (in Episode 3). The analyses of contrasts also indicated intracultural differences. The secure infants in the modified kibbutz sample showed more avoidance and more proximity seeking during Episode 3 than did secure infants in the Israeli day-care sample. Also, secure infants in the modified kibbutz sample appeared to be more impressed by the procedure than did secure infants in the day-care sample. From a Western European perspective, secure Swedish infants showed more avoidance and distance interaction than did other Western European samples. Germany did not take a specific position in this respect.

Discussion and Conclusion

Primary Appraisal

Interactive behaviors in the preseparation episodes appear to predict attachment classifications, although as expected with a modest predictive power. Whereas attachment classifications are primarily based on information generated during reunion episodes, the way in which infants appraise the Strange Situation before being separated from their caregiver appears to be part of their general strategy to deal with their attachment figures in circumstances with varying degrees of stress (Main, 1990). Anxiously attached infants already exhibit less trust during the preseparation episodes in comparison with securely attached infants. In particular, infants classified as anxious—resistant show more resistance to their mothers and to the stranger in the preseparation episodes than do secure or avoidant infants. Furthermore, infants classified as securely attached show less avoidant behavior to their mothers in the preseparation episodes and keep more in touch through distance interaction and proximity seeking than do infants classified as anxiously attached. From the onset of the Strange Situation procedure, infants classified as

secure appear to show a pattern of open communication (Grossmann, Grossmann, & Schwan, 1986). Not surprisingly, resistant and avoidant behaviors were also found to be important predictors of anxious attachment in an analysis of reunion episodes (Lamb et al., 1985). Thus our data nicely supplement this important secondary data analysis. Our data also corroborate Ainsworth et al.'s (1978) classifications by showing that avoidant and resistant strategies of dealing with stress can already be observed before separation.

Cross-Cultural Comparisons

Confirmation of the primary appraisal hypothesis has provided us with a basis for carrying out cross-cultural comparisons. In this approach, we empirically selected preseparation behavior indicative of subsequent Strange Situation classifications. An alternative approach would have been to include a priori those interactive scales that seem to be indicative of stress. We adopted the former approach because it provides an empirically derived subset of pertinent variables within the framework of attachment theory. Furthermore, this approach is more likely to minimize multicollinearity problems caused by conceptual and operational overlap between variables. For example, contact maintenance did not appear to be a discriminating variable, although from a theoretical perspective it could be conceived as an indication of distress. The exclusion of contact maintenance, however, is not surprising, because any contact maintenance by default implies proximity seeking, and the latter variable indeed was retained as a major discriminating variable.

A relatively small number of significant differences in primary appraisal are found in comparison with the total number of possible differences (43 contrasts out of 560 [about 8%]; for the B-classified infants alone, nine groups were compared with each other on 10 relevant variables). Of the 43 relevant contrasts, 36 belong to the secure groups. Because the B-classified group is more heterogeneous than the A- or C-groups, and because the B-classified subcategories are not always equally distributed across samples, more differences are likely to be found when compared with the anxiously attached groups. More important, mainly two countries (Sweden and Israel) account for the significant contrasts (39 out of 43).

The Israeli kibbutz samples, in particular, appear to be responsible for most (26) of the differences in primary appraisal of the Strange Situation. In general, kibbutz infants seem to be more anxious during the preseparation episodes than infants from the other samples. However, a cross-cultural explanation is not necessarily adequate. Intracultural differences are also present between the Israeli day-care and the kibbutz samples. In particular, the infants in the modified kibbutz sample appear to be more impressed by the procedure than do infants in the day-care sample. Because kibbutz infants do not meet with strangers as frequently as do infants who reside in cities, they may be more alert to their presence (Sagi et al., 1985). This may also explain why infants' sociability toward an unfamiliar adult is related, especially in Israeli kibbutzim, to infant behavior in the Strange Situation (Sagi et al., 1986). We suggest that the relatively anxious primary appraisal by the kibbutz infants reflects the rather extraordinary child-rearing circumstances associated with the kibbutz system. It is exactly these child-rearing practices that differ so markedly from those considered to stimulate secure attachment relationships (e.g., Ainsworth et al., 1978). Incidentally, an explanation of attachment classification differences in terms of temperament seems less plausible against the background of the intracultural differences in Strange Situation behavior as well as concomitant differences in child-rearing circumstances (Sroufe, 1985).

Next to the Israeli kibbutz samples, the Swedish sample contributes to 13 of the significant contrasts. On the one hand, the Swedish infants seem to be more anxious because they show

more avoidance, and on the other hand, they seem to be more secure because they show more distance interaction with their mothers in comparison with some of the other samples. It should be noted that Swedish infants appear to be a specific group, not only in comparison with groups outside Western Europe but also inside this geographic area. The meaning of this pattern, however, is not clear, and differences between raters across laboratories as a possible explanation does not seem to be the case, because the same group of raters coded Strange Situations in the United States, Sweden, Israel, and Germany (Bielefeld).

Two samples have received a lot of attention in the cross-cultural debate on attachment: the Japanese and Bielefeld samples. The much discussed Bielefeld sample only accounts for three differences. First, the Bielefeld securely attached infants seek less proximity to their mothers in the first episodes than do their U.S. counterparts. In the Bielefeld B-classified group, the B1- and B2-subgroups prevail, which may explain their seeking less proximity. Second, German A-classified infants (which includes the Bielefeld A-classified group) show less avoidance in both preseparation episodes than Swedish A-classified infants. Less preseparation anxiety may be characteristic of what has been termed "avoidant infants with good mood" (Grossmann et al., 1986): Those avoidant infants who feel at ease in the preseparation episodes may turn out to be the subgroup of avoidant infants with good mood. Surprisingly, the Japanese sample is not in any extreme position either. The securely attached Japanese infants interact mostly like the Dutch and Berlin secure infants. Japanese B-classified infants, however, show less distance interaction, which is a less irritating communication pattern (i.e., reducing positive behavior) than would be the case in using more expressively avoidant or resistant infants (Takahashi, 1990). The Japanese C-classified infants show less avoidance than their Israeli counterparts, which may be explained by the presence of "pseudo-C" infants (Miyake et al., 1985) or "inconsistent-C" infants (Takahashi, 1986), who appear to behave rather securely until the second separation (Takahashi, 1986).

In general, our data do not substantiate the hypothesis on cross-cultural differences in primary appraisal. Besides the exceptional kibbutz sample, which represents a unique child-rearing arrangement, no other systematic differences could be traced.

Procedural Variations

Unfortunately, procedural variations characterize some of the cross-cultural attachment research, and these variations may obscure cross-cultural differences. If procedural variations had any major impact on the infants' primary appraisal of the Strange Situation, we would have found systematic differences between samples with differing procedures. Those samples with a stranger sociability test preceding the Strange Situation, however, do not differ as a group from the other samples. Even within the Israeli samples that are homogeneous with respect to the procedure, cultural (or subcultural) differences have been detected that cannot be attributed to the preceding stranger sociability assessment. Furthermore, the Bielefeld sample, which was confronted with a deviating size playroom, does not differ systematically from the other samples in their primary appraisal of the Strange Situation. Last, although the Dutch sample consists of somewhat older subjects, in most comparisons they do not take a unique position.

In summary, we would like to suggest that procedural variations cannot explain the cross-cultural differences. The Strange Situation seems to be quite robust against the procedural variations that have been introduced into cross-cultural research on attachment. This suggestion concurs with the finding of Sagi and his associates that the Strange Situation outcome was not affected by order and time of assessment (Sagi et al., 1985) or by abbreviations of the procedure due to extreme distress on the part of the infant (Oppenheim et al., 1988).

The fact that more similar than different patterns were found for countries with differing distributions does not support the position of differential cross-cultural primary appraisals. In other words, no confirmation has been given to the concern that the meaning of the Strange Situation is perhaps different for different countries. On the contrary, with few exceptions our data may suggest once again that infants in these countries do make similar appraisals of the Strange Situation.

The outcome of our investigation is necessarily limited by the available data. The six countries that we were able to include in our secondary analyses by no means exhaust the broad range of existing cultures. More attachment data on African and Eastern European cultures are indeed needed. In the major part of Eastern Europe, most infants are used to nonmaternal care arrangements from an early age (Kamerman & Kahn, 1978), thus exposing them to early separations. In many small communities in rural parts of West and East Africa, infants are being raised by their siblings and other members of the extended family in addition to being raised by their parents (Kermoian & Leiderman, 1986); they therefore have less opportunity to interact with unfamiliar adults outside this environment. Should the primary appraisal of the Strange Situation in such cultures not differ from the findings presented here, we would have further support for our conclusions. Furthermore, the next step in testing the cross-cultural validity of the Strange Situation would be to validate the procedure within each culture against external variables that are theoretically supposed to be related to infants' behavior in the Strange Situation (Van IJzendoorn, 1990). In this way, it could be tested whether the implications of a secure or anxious attachment for future adaptation to specific cultural demands are the same across different cultures (Main, 1990). In this respect, one should note the importance of the Grossmann and Grossmann (1990) data showing somewhat similar patterns of correlations between classifications and home observations as the Ainsworth et al. (1978) data. Promising evidence on short- and long-term consequences of attachment classifications is already available in the former Federal Republic of Germany (Lutkenhaus, Grossmann, & Grossmann, 1985), Israel (Oppenheim et al., 1988), the Netherlands (Van IJzendoorn, Van der Veer, & Van Vliet-Visser, 1987), Japan (Takahashi, 1990), and the United States (e.g., Main, 1990 ; Sroufe, Fox, & Pancake, 1983), but efforts have not yet been sufficiently coordinated to allow for quantitative meta-analyses.

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Table 1.

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