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Separation Protest in Guatemalan Infants: Cross-Cultural and Cognitive Findings[1]

BARRY M. LESTER[2]
Institute of Nutrition of Central America and Panama, Guatemala City, Guatemala

MILTON KOTELCHUCK
Harvard University

ELIZABETH SPELKE
Yale University

MARTHA JULIA SELLERS
Harvard University

ROBERT E. KLEIN
Institute of Nutrition of Central America and Panama, Guatemala City, Guatemala

The purpose of the present study was to investigate the onset and development of separation protest in a non-Western culture. Forty-two boys and girls distributed over the ages of 9, 12, 18, and 24 months were assessed for reactions to arrivals and departures of their mother, father, and a stranger. The infants were also given a test of object permanence. The results showed that the pattern of separation protest was similar in Guatemala and the United States although the age of onset of separation protest was earlier in Guatemala. The results also gave tentative support for a relation between separation protest and object permanence.

It is well established that infants in Western societies show considerable protest upon separation from their mothers (Maccoby & Masters, 1970). The age trends in the development of separation protest have also been documented and reveal that separation protest emerges toward the end of the first year, peaks at 15–18 months, and decreases in the second year of life (Kotelchuck, 1972).

Separation protest has not, however, been investigated systematically in non-Western cultures. Ainsworth's (1967) pioneering work among the Ganda suggests that separation protest should follow a similar pattern of development in non-Western as in Western societies, although her finding that protest in Uganda appeared as early as six months implies a possible cultural interaction. The purpose of the present investigation was to examine the development of separation protest in a Ladino (Spanish speaking and of mixed Indian-European stock) culture in Guatemala.

While the occurrence of separation protest has been widely reported, the casual mechanisms underlying its onset and development are still not clear. Most investigators have assumed an affective model in which separation protest is viewed as an expression of concern directed at the departing parent (Ainsworth, 1967; Bowlby, 1969). Recent studies, however, have suggested that separation protest may be mediated by cognitive factors (Littenberg, Tulkin, & Kagan, 1969; Schaffer, 1971; Spelke, Zelazo, Kagan, & Kotelchuck, 1973).

One cognitive model, proposed by Schaffer (1971), attempts to tie the onset of separation protest directly to the level of object permanence of the infant. According to this model, separation protest cannot occur until the fourth sensorimotor period (Piaget, 1954) when the infant is able to search for an object after it disappears. In other words, separation protest begins when the infant's attempts to recover the missing parent are frustrated. In the present in-

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[2] Requests for reprints should be sent to Barry M. Lester, who is now at the Department of Psychology, University of Florida, Gainesville, Florida 32611.

vestigation this hypothetical model was examined by relating the infant's level of object permanence to his reaction to parental departure.

Method

Subjects

The subjects were 42 infants, six boys and six girls at each of the ages 9, 12, and 18 months and three boys and three girls at 24 months. All subjects were selected from Ladino families of lower socioeconomic class living in Antigua, Guatemala, a city of approximately 20,000 inhabitants located 40 kilometers from Guatemala City. Families were defined as low socioeconomic status if neither parent received more than a primary school education, the mother did not work outside the home, and the father was a day laborer or farmer.

Procedure

Mothers were contacted at home by a Guatemalan research assistant who asked that she and her husband collaborate in a study concerning infant play in the presence and absence of the parents and a strange Guatemalan woman. Arrangements were then made to bring the mother, father, and infant to a rented house in Antigua which served as the laboratory. The laboratory consisted of two rooms (each 3.0 × 4.5 meters) painted and decorated to look like a typical Antiguan house. Each room contained two chairs, a straw mat on the floor, and two pictures on pastel-colored walls. All infants were tested within seven days of their birthday.

On arrival at the laboratory, infants were given a 15-minute adaptation period followed by the test of object permanence. The test was administered by a Guatemalan research assistant in the presence of both parents who were instructed not to interact with the child during test administration.

The instrument used to measure object permanence was a Spanish translation of the Object Permanence Scale of the Albert Einstein Scales of Sensory-Motor Development (Corman & Escalona, 1969). The test measured the infants' ability to find an object hidden in a series of progressively more difficult displacements. The administration and scoring of the test followed the procedure outlined by Corman and Escalona, in which each infant was assigned a score reflecting his stage of object permanence. This score was defined as the stage representing the most difficult item performed by the infant on two successive trials.

Following the administration of the Einstein scale, the infant was given a 10-minute rest period and then brought into a second room in which the separation experiment was conducted. The design employed was modeled after that reported by Kotelchuck (1972), wherein infant behavior in an unfamiliar playroom was examined as a function of the presence and absence of the mother, father, and stranger. Initially, the infant was placed in the center of the room surrounded by 10 standard infant toys (wooden blocks, concentric rings, plastic dolls, and animals). The parents were seated one meter apart at one end of the room in front of a one-way screen two meters from the infant. Every 2 minutes one of the adults (mother, father, or stranger) was signaled to either enter or leave the room. The parents and the stranger, a second Guatemalan research assistant, were instructed to sit quietly and not to initiate any interaction with the infant. The 26-minute procedure was composed of the following 13 episodes defined in terms of which adult(s) remained in the room with the infant: mother and father, father, father and stranger, stranger, stranger and mother, mother, mother and father, mother, mother and stranger, stranger, stranger and father, father, and father and mother.

Infant behaviors were coded continuously during each 2-minute period by a single observer seated behind a one-way screen behind the parents. For the arrival periods, coding began with the opening of the door and continued for 2 minutes at the end of which an adult departed. Coding ceased during the actual departure, which lasted about 10 seconds, and resumed following the closing of the door. A period began irrespective of the location of the infant although most infants remained on the straw mat in the center of the room. The behaviors measured were duration (in seconds) of playing and of crying; proximity to mother, father, stranger, and door; looking at mother, father, and stranger; and number of vocalizations and smiles. The coder was the same as in the Kotelchuck (1972) study in which the interrater reliability for these measures ranged from .80 to .99. The coder signaled an adult to depart by tapping on the screen; adult entrance was signaled when the coder rang a bell heard in an adjoining room.

Since Kotelchuck (1972) found no order effect due to the initial parental departure, the present study used only the above fixed schedule. The schedule was constructed such that the infant experienced an exact parallel set of departures and arrivals for each of the three adults. Also, each adult arrived and departed twice, once in the presence of each of the other two adults. For example, the mother departed once with the father remaining and once with the stranger remaining. Data from similar episodes were pooled to determine the extent to which the infants behaved differentially to the mother, father, and stranger. These differences were then tested with a 4 (Ages) × 2 (Sexes) × 3 (Adults) analysis of variance with repeated measures over the last factor. The adult factor is the infant's response to each adult for the episodes in which the adult arrived, departed, or remained with the infant.

Results and Discussion

Separation Protest in Guatemala

As presented in Figure 1, the analysis for duration of play when the infant was alone with each adult showed only a significant main effect for adult ($F = 22.06$, $df = 2/68$, $p < .001$) with no significant interaction effects. Analysis for simple effects revealed that infants played less when alone with the stranger (i.e., separated from both parents) than when alone with either the

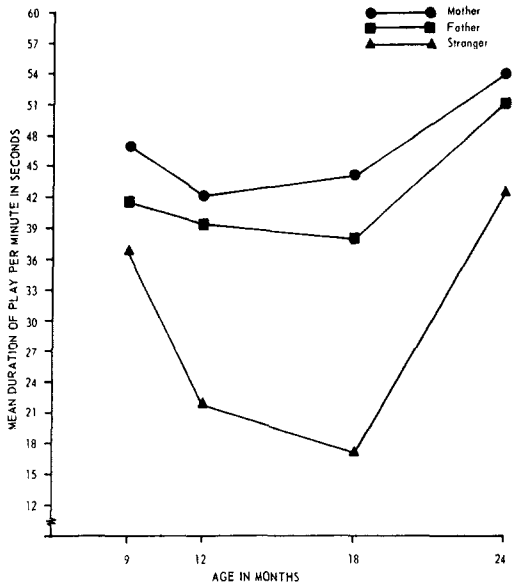

Figure 1. Mean duration of play when alone with each adult (Guatemala).

mother ($F = 43.56$, $df = 1/68$, $p < .001$) or the father ($F = 25.00$, $df = 1/68$, $p < .001$). Infants maintained the same high level of play when alone with the mother or the father.

Figure 1 also shows that infant play when alone with the stranger changed over age. A 4 (Age) × 2 (Sex) analysis of variance revealed only a significant main effect for age ($F = 4.56$, $df = 3/34$, $p < .01$) with no significant interaction effects. Analysis for simple effects showed that infants played more when alone with the stranger at 24 months than at 18 ($F = 8.44$, $df = 1/34$, $p < .01$) or 12 months ($F = 5.29$, $df = 1/34$, $p < .05$) and at 9 months than at 18 months ($F = 8.18$, $df = 1/34$, $p < .01$). Differences between the 12- and 18-month-old infants and between the 9- and 24-month-old infants were not significant. As can be seen from Figure 1, duration of play when alone with the stranger is a ∪-shaped function of age.

These episodes in which the infant was left alone with the stranger (i.e., separated from both parents) were the most stressful conditions in the study. Infants at each age played less following the maternal departure when left alone with the stranger (Episode 10) than when left alone with the father (Episode 2) (all Wilcoxon ps $< .01$). Likewise for paternal departures, infants played less when left alone with the stranger (Episode 4) than when left alone with the mother (Episode 8) (all Wilcoxon ps $< .05$).

Change in play following the departure of each adult, presented in Figure 2, was calculated by subtracting the duration of play in the episode preceding departure from the duration of play in the episode following departure. The analysis revealed a significant main effect for the adult factor ($F = 23.11$, $df = 2/68$, $p < .001$). No other significant main or interaction effects were found. Analysis for simple effects revealed that infant play decreased more following the departure of either parent than following the departure of the stranger (for mother, $F = 50.41$, $df = 1/68$, $p < .001$; for father, $F = 14.09$, $df = 1/68$, $p < .001$). Infant play decreased more following the departure of the mother than following the departure of the father ($F = 10.76$, $df = 1/68$, $p < .005$).

Change in crying following the departure of each adult, presented in Figure 3, was calculated by subtracting the duration of crying in the episode preceding departure from the duration of crying in the episode following departure. The analysis revealed

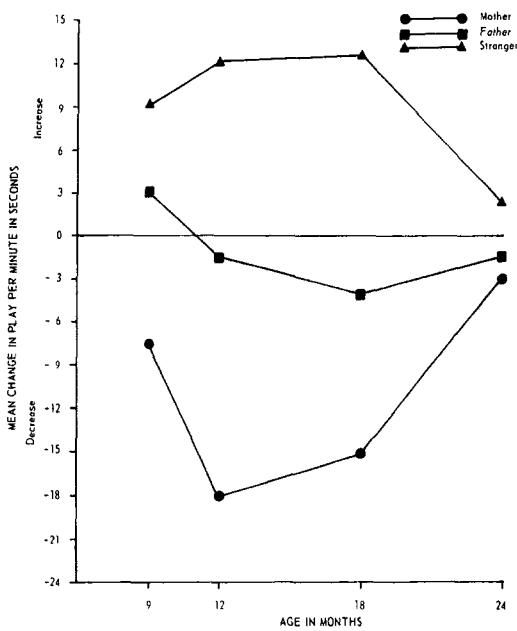

Figure 2. Mean change in play following the departure of each adult (Guatemala).

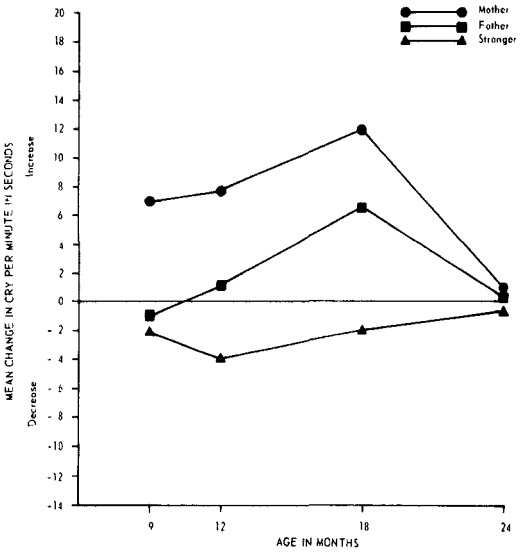

Figure 3. Mean change in crying following the departure of each adult (Guatemala).

only a significant main effect for the adult factor ($F = 5.28$, $df = 2/68$, $p < .01$) with no significant interaction effects. Analysis for simple effects showed that infant crying increased more following the departure of the mother than the stranger ($F = 11.34$, $df = 1/68$, $p < .005$), whereas change in crying following the departure of the father did not differ from the stranger or the mother. Departure of the mother produced an increase in crying at all ages and departure of the father at all but one age. In contrast, departure of the stranger produced a decrease in crying at all ages.

The duration of time spent near the door following adult departures can also be viewed as a measure of separation protest. This analysis revealed a significant main effect for the adult factor ($F = 4.71$, $df = 2/68$, $p < .025$) with the main effect for age approaching significance ($p < .10$). This age effect appeared to be due to the increasing mobility of the infants. Analysis for simple effects showed that infants spent more time near the door following the departure of the mother than following the departure of the stranger ($F = 10.24$, $df = 1/68$, $p < .005$), suggesting that infants tried to recover the mother. Time near the door following the departure of the father did not differ from the stranger or the mother.

The aftereffects of separation from the parents can be seen in the arrival or reunion episodes. For all subsequent variables the analyses revealed significant main effects only for the adult factor (all $ps < .01$). Analyses for simple effects showed that infants played more upon arrival of the parents than upon arrival of the stranger (for mother, $F = 4.30$, $df = 1/68$, $p < .05$; for father, $F = 10.18$, $df = 1/68$, $p < .005$). During the arrival episodes infants also spent more time near the mother or father than near the stranger (for mother, $F = 8.21$, $df = 1/68$, $p < .01$; for father, $F = 6.79$, $df = 1/68$, $p < .025$) and had more physical contact with the mother or father than with the stranger (for mother, $F = 17.89$, $df = 1/68$, $p < .001$; for father, $F = 6.55$, $df = 1/68$, $p < .05$). These results suggest that infants increased behavioral interactions toward the parents when they arrived and showed a distinct avoidance of the stranger when she arrived.

These results demonstrate clearly the existence of separation protest in a non-Western society. Infants manifested extensive protest following the departure of their parents and showed little concern over the departure of the stranger. Although protest occurred at all ages, the effect was curvilinear peaking at 12 and 18 months. Separation protest in Guatemala was also stronger following maternal than following paternal departures and revealed no sex differences.

These data permit a methodological observation on the measurement of separation protest. In this study, play rather than crying proved to be the most discriminating indicator of separation protest. This may be due to the changing function of crying in the first two years of life. If crying is viewed as an instrumental response to recover the missing parent (e.g., Ainsworth, 1967), then the emergence of other instrumental responses, such as locomotion, may decrease the utility of crying, especially at older ages. Play, on the other hand, is a more sensitive reflection of separation protest because it measures the changing state of the infant. Furthermore, since play is not an instrumental response to recover the parent, the functional significance of play should not be affected by changes in instrumental behavior in older infants.

Table 1: Number of Subjects at Each Stage of Object Permanence by Chronological Age

Stage of object permanence	Age 9	12	18	24
3	5	2	0	0
4	6	5	1	0
5	0	2	1	0
6	1	3	9	1
Complete	0	0	1	5

Note. Age is given in months.

Relation between Separation Protest and Object Permanence

Table 1 presents the number of infants at each stage of object permanence by chronological age. A 4 (Age) × 2 (Sex) analysis of variance for stage of object permanence revealed that performance on the Einstein scale increased with chronological age ($F = 20.56$, $df = 3/41$, $p < .001$). No other significant main or interaction effects were found.

To test the relation between amount of separation protest and stage of object permanence, change in play following the departure of each adult and duration of play when alone with the stranger were compared for infants above and below the third sensorimotor stage. The division at Stage 4 (i.e., above Stage 3) was chosen following Schaffer's (1971) notion that this is the stage at which the infants' understanding of the existence of objects is mature enough to permit pursuit of lost objects.

At 9 months of age infants above Stage 3 of object permanence played less following the departure of the mother (Mann-Whitney $U = 4$, $p < .01$) and played less when alone with the stranger (Mann-Whitney $U = 4$, $p < .01$) than infants at Stage 3 of object permanence. Play following departure of the father did not vary by stage of object permanence. At 12 months of age, infants above Stage 3 of object permanence played less following the departure of the mother (Mann-Whitney $U = 2$, $p < .005$) and the father (Mann-Whitney $U = 3$, $p < .01$) and played less when alone with the stranger (Mann-Whitney $U = 1$, $p < .003$) than infants at Stage 3 of object permanence. For the 18- and 24-month-old infants, stage of object permanence was not sufficiently distributed to permit a statistical test. Similar analysis for the crying data revealed no significant differences by stage of object permanence. This is probably due to the combined effects of a small number of infants at each age and the lack of sensitivity of the crying variable.

The results revealed that at both 9 and 12 months of age, infants above the third stage of object permanence showed more separation protest than did infants at the third stage. These findings give tentative support to Schaffer's (1971) hypothesis that stage of object permanence is related to the onset of separation protest.

A more definitive test of the hypothesis would require a large distribution of infants at each stage of object permanence within chronological age. Moreover, one would have to demonstrate that the infant's understanding of the way in which an object is hidden is consonant with his reaction to the way in which the parent departs. Furthermore, if cognitive factors are salient in the onset of separation protest, one might speculate that the decrease of separation protest in the second year is related to the simultaneous completion of object permanence.

Cross-Cultural Comparison of Separation Protest

Separation protest in Guatemala and in the United States was compared by using the present data and that collected by Kotelchuck (1972) for those infants whose behavior was observed for the same order of person entry in the two studies. Presented in Figures 4–6 are the mean levels of performance for the United States infants for duration of play when alone with each adult, change in play on departure for each adult, and change in crying on departure for each adult.

Duration of play when alone was virtually identical for the Guatemalan (Figure 1) and North American (Figure 4) infants. Duration of play when alone with the mother or father did not change across age, whereas duration of play when alone with the stranger dropped dramatically at the intermediate ages in both cultures. Being alone with the stranger was the condition of least play in both the Guatemalan and

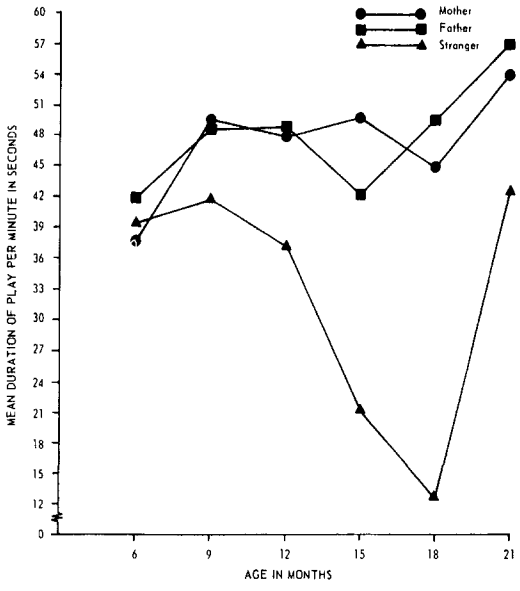

Figure 4. Mean duration of play when alone with each adult (United States).

United States experiments. These two curves showed that in both cultures, duration of play when alone with the stranger was a U-shaped function for the respective ages tested.

The results for the departure measures, change in play on departure and change in crying on departure, were also similar in the two cultures. A comparison of Figure 2 with Figure 5 and Figure 3 with Figure 6, reveals that in both Guatemala and the United States, departure of the mother and father resulted in a decrease in play and an increase in crying, whereas departure of the stranger resulted in an increase in play and a decrease in crying.

Besides these similarities there were two major differences in separation protest between Guatemalan and United States infants. First, an examination of the figures reveals that Guatemalan infants showed less protest upon paternal departure than United States infants. In Guatemala, change in play was the only departure variable which significantly discriminated the father from the stranger; neither change in crying nor proximity to door showed significant father–stranger differences. By contrast, among United States infants all three measures showed highly significant father–stranger differences. This cultural difference probably reflects the fact that Latin fathers spend even less time with their infants than do American fathers.

The second cultural difference is that separation protest emerged slightly earlier in Guatemala than in the United States. More children showed separation protest at 9 months of age (increase in crying on mother's departure) in Guatemala than did in the United States ($\chi^2 = 4.80$, $df = 1$, $p < .05$). Moreover, Guatemalan infants showed a greater amount of protest at 12 months. Figures 1 and 4 reveal that at 12 months of age Guatemalan infants played less in the presence of the stranger than American infants ($\chi^2 = 4.80$, $df = 1$, $p < .05$). Thus, the earlier onset of separation protest in Guatemala is reflected in both a greater frequency of separation protest at 9 months of age and a greater amount of protest at 12 months of age.

Perhaps the earlier onset of separation protest in Guatemala is related to the earlier saliency of the separation experience for the Latin infant. While separation from the parents is a frequent occurrence in the United States (e.g., the infant is often placed in his own room), such an event is unusual

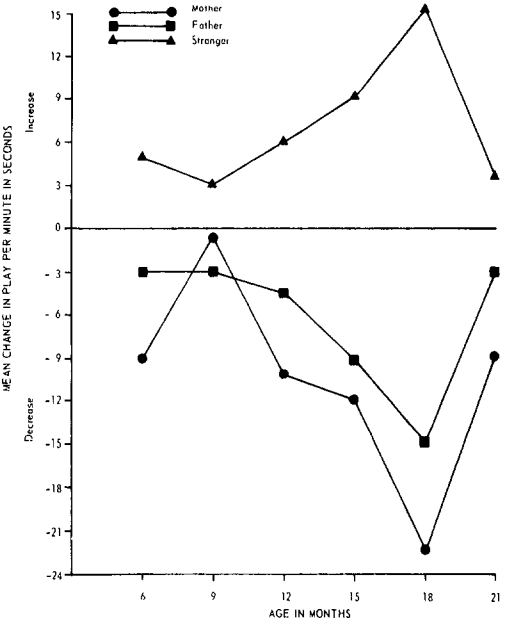

Figure 5. Mean change in play following the departure of each adult (United States).

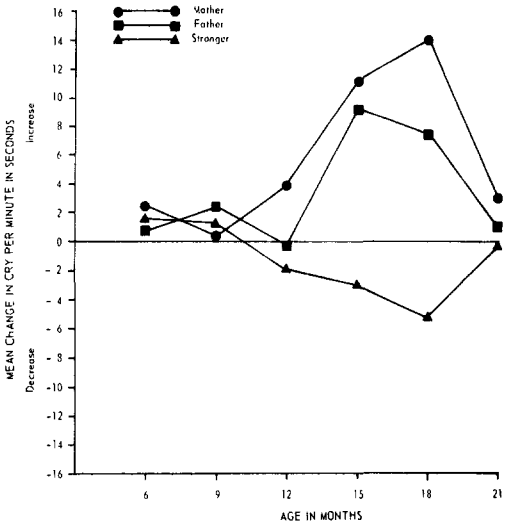

Figure 6. Mean change in crying following the departure of each adult (United States).

in Guatemala, where most families live in a one-room *rancho*. Thus, the onset of separation protest may be related to the extent to which the separation experience is a dissonant event for the infant. For example, Littenberg et al. (1969) found that infants cried more when their mothers left through an unfamiliar than through a familiar door.

Cross-cultural evidence for this notion comes from Ainsworth's (1967) observation that among the Ganda, where the infant spends most of his time on his mother's back, and hence separation is an extremely unusual event, separation protest occurred as early as six months. By contrast, in the United States, where separation is a common occurrence, separation protest does not emerge until the end of the first year.

Finally, although the age of onset of separation protest appears to be influenced by cultural factors, the results from this study suggest that the overall pattern of separation protest is similar in Western and non-Western societies.

REFERENCES

AINSWORTH, M. *Infancy in Uganda: Infant care and the growth of attachment.* Baltimore: Johns Hopkins Press, 1967.

BOWLBY, J. *Attachment and loss.* Vol. 1. New York: Basic Books, 1969.

CORMAN, H., & ESCALONA, S. Stages of sensorimotor development: A replication study. *Merrill-Palmer Quarterly,* 1969, **15,** 351–361.

KOTELCHUCK, M. The nature of the child's tie to his father. Unpublished doctoral dissertation, Harvard University, 1972.

LITTENBERG, R., TULKIN, S., & KAGAN, J. Cognitive components of separation anxiety. *Developmental Psychology,* 1971, **4,** 387–388.

MACCOBY, E., & MASTERS, J. Attachment and dependenccy. In P. Mussen (Ed.), *Carmichael's manual of child psychology.* Vol. 2. New York: Wiley, 1970.

PIAGET, J. *The construction of reality in the child.* New York: Basic Books, 1954.

SPELKE, E., ZELAZO, P., KAGAN, J., & KOTELCHUCK, M. Father interaction and separation protest. *Developmental Psychology,* 1973, **9,** 83–90.

SCHAFFER, H. R. *The growth of sociability.* Baltimore: Penguin Books, 1971.

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