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"INTENSITY" IS A KEY TERM IN DEVELOPMENTAL PSYCHOLOGY!

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Abstract

In the process of analyzing our 4 studies, we have realized that "Intensity" of behaviors and "Intensity" of stimuli are important aspects in understanding the results. In developmental psychology, quantity indices are used often but quality indices are not. "Intensity" should be one important viewpoint to understand data in developmental psychology clearly.

Key Words: intensity, quality index, quantity index, cultural differences.

In this paper we will summarize the results of 4 studies by ourselves. After that we want to present one viewpoint to understand the results of the studies in developmental psychology.

1. A longitudinal study of Japanese and American mother-infant interactions (*PSYCHOLOGIA, 1994*).

The interactions between thirteen Japanese and five American mothers and their infant were observed longitudinally during the first year of the infants' lives in their homes. This study was carried out by Yuko Kanaya & us. Figure 1 presents the infant vocalization data (The data for the 8 American dyads can be neglected here). As Figure 1 shows, there were few differences between Japanese and American infants. Figure 2 presents the maternal vocalization to infant. As Figure 2 indicates, there were differences between Japanese and American mothers. American mothers vocalized to and touched their infants more. Figure 3 presents the interaction by infant vocalization and maternal vocalization. Here, interaction means chains of behaviors. In Figure 3 the total data of "interaction initiated by infant vocalization and responded by caregiver's (mother's) vocalization" and "interaction initiated by caregiver's vocalization and responded by infant vocalization" are presented. As Figure 3 shows, there were more interactions between American dyads than between Japanese dyads.

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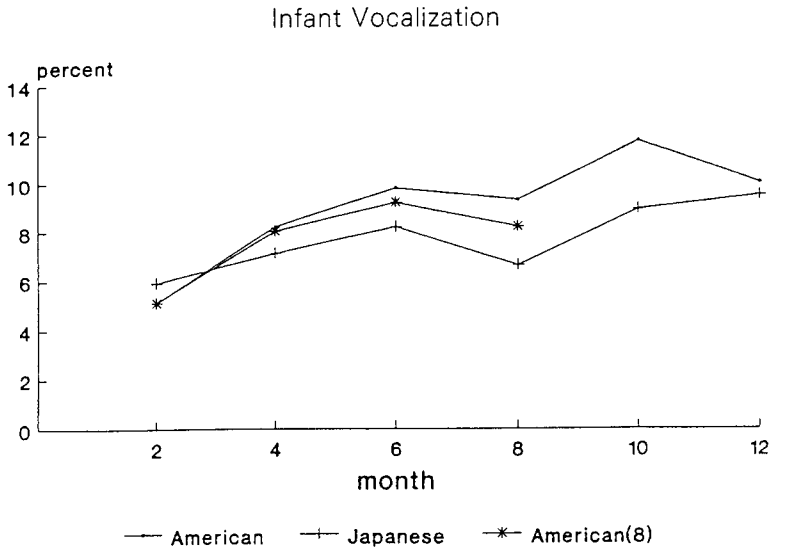

Figure 1. Comparison of infant behavior.

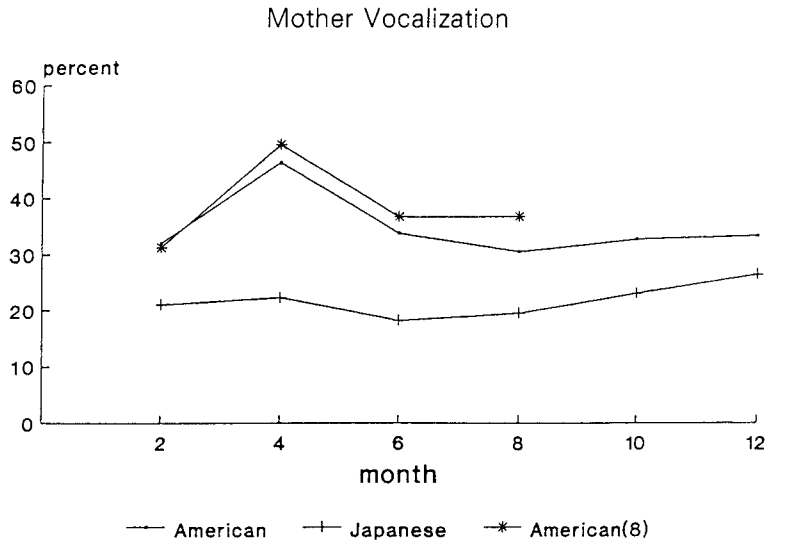

Figure 2. Comparison of maternal behavior.

In the process of analyzing the main results discussed above, we found another aspect of the differences between Japanese and American dyads. One of the authors wrote, " Interactions by American infant-mother dyads are stronger than those of the Japanese. It may be possible to record these differences using different marks. For example, strong interaction recorded by a_{-}, and weak interaction by $a_{\mp}$etc. The author thinks these differences correspond with direct and indirect interactions de-

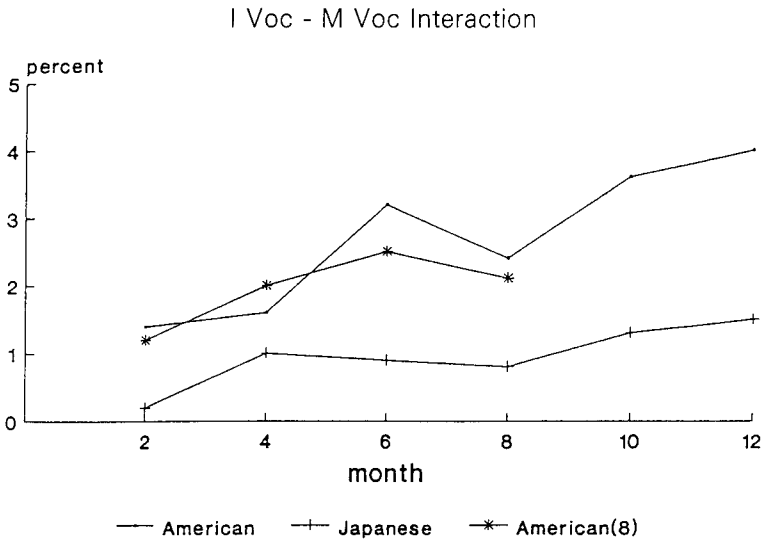

Figure 3. Comparison of interaction.

scribed by Lewis & Feiring (1981) [Kawakami, 1982, p. 89]." This is the beginning of our interest in the key word " Intensity ".

2. Deception in children (*JAPANESE JOURNAL OF CHILD AND ADOLESCENT PSYCHIATRY, 1995*).

Michael Lewis employed a simple paradigm to study deception in children. " The child is brought into a room where, unknown to the child, the child is videotaped. While the child is sitting at a table, the experimenter, behind the child, unpacks and constructs an elaborate and complex toy. While doing so, the experimenter instructs the child not to turn around and look at the toy that is being set up. The experimenter encourages the child not to look and informs the child that the child will be able to look and play with the toy some time later. After the toy is constructed, the experimenter informs the child that she must leave the room for a few minutes. The experimenter tells the child not to look at the toy while she is gone. The experimenter leaves and the child is left in the room for 5 minutes if he does not look at the toy, or until he turns around and looks. As soon as the child looks, the experimenter returns to the room and looks at the child. • • • The experimenter says to the child, ' Did you peek ? ' The child's verbal response, as well as its facial and bodily behavior, are recorded and scored from the videotapes (Lewis, 1993, p. 95)."

We examined Japanese children's ability to deceive by Lewis's paradigm. With fifty-one children from 3 to 6 years, some 3-year-old children could not understand the instruction. And there were a few 3 to 4-year-old children who could control their desire to peek.

We did a pilot study in 1989 with Japanese children, and the data were presented in the article by Lewis (1993). In it Lewis claimed there were no big differences in

responses between Japanese and American children. But "One cultural difference did emerge which is consistent with the differences reported between Japanese and Americans. Although patterns were similar for children of both cultures, Japanese children showed less facial behavior, less smiling, lip biting, frowning, and nervous touching, than did American children (Lewis, 1993, p. 100)." We think Lewis's viewpoint is completly true, but it is possibile to take an another aspect. It is the "Intensity" of behavior. For example, a smile response of an American child is sometimes stronger than that of a Japanese. At the time we analyzed the data, we did not take note of this aspect. It will be necessary to compare the differences not only in quantity of behaviors but also in their quality.

3. Differences between Japanese infants and Caucasian American infants in behavioral and cortisol response to inoculation (*CHILD DEVELOPMENT, 1993*).

One of the authors studied the comparative differences between Japanese and Caucasian American infants in behavioral and cortisol response to inoculation with M. Lewis and Douglas S. Ramsay. The American group showed a more intense initial affective response and a longer latency to quiet than the Japanese group; the Japanese group showed a greater cortisol response.

In this study we coded for infant's peak facial and vocal expressions during each 5-sec interval using videotapes. "Peak facial expression was coded on a 0-3 scale: full distress (3), for affective expression involving the brows, cheeks, and mouth; partial distress (2), for affective expression involving any two of these three areas; minimal distress (1), when only one of the areas was involved; and no distress(0). Peak vocal expression was also coded on a 0-3 scale: full cry (3), for a continuous rolling cry; fuss cry (2), for crying that dampened during the interval; minimal cry (1), for discrete frets or squeaks; and no sound(0) [Lewis, Ramsay & Kawakami, 1993, p. 1725]." This coding system is important, because the viewpoint of intensity is included in it. And it will be necessary to consider individual differences in intensity of response. For example, one infant is crying harder, but his/her energy to cry is not so great. At that time a coder will give him/her 2 or 1 point, but it may be a 3 from the infant's viewpoint. This point should be taken into consideration when we think about handicaped children.

4. The effect of sounds on newborn infants under stress (*INFANT BEHAVIOR & DEVELOPMENT, 1996*).

This study was carried out with Hiroyuki Kurihara, Yukiko Shimizu, and Takumi Yanaihara. Five-day-old infants' responses to heelstick stress were assessed with behavioral and physiological indices. The subjects were divided into three groups: the WHITE group (n=35), who were presented with white noise during the heelstick; the HEART group (n=33), who were presented with recorded heartbeat sounds during the heelstick; and the CONT group (n=34), who were presented with no sounds. Figure 4 shows the means of coded behavioral responses by CONT, HEART, and WHITE group. Preheelstick and postheelstick cortisol levels in saliva are shown in Table 1. The CONT group showed more reactive behavioral responses and adrenocor-

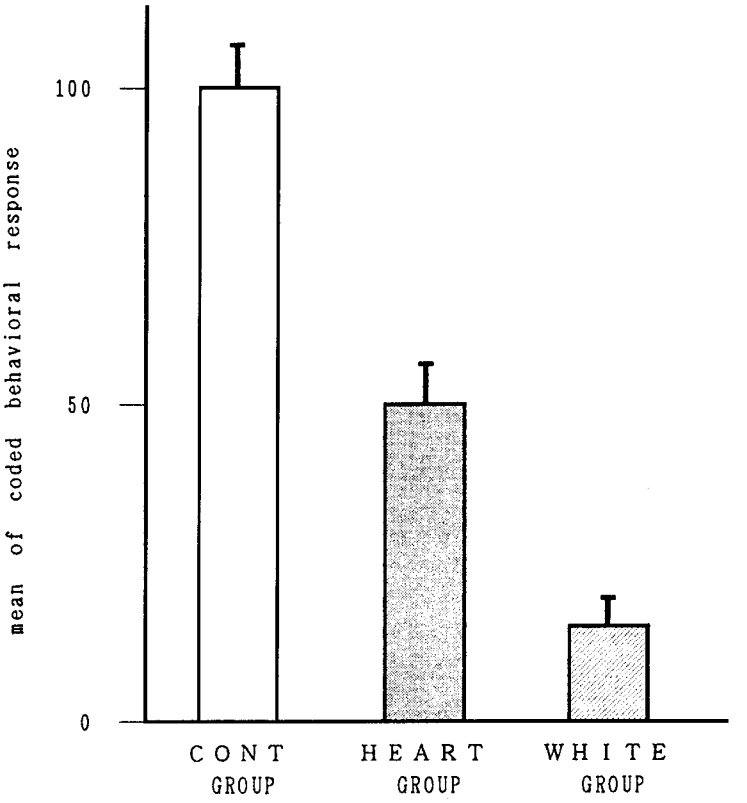

Figure 4. Means of codes behavioral responses. Standard error of the mean is indicated by the line above the bar.

Table 1. Preheelstick and Postheelstick Cortisol Levels in Micrograms/Deciliter for Infants in the Three Groups

	CONT	HEART	WHITE
Preheelstick	0.82 (0.61)	0.43 (0.38)	0.63 (0.45)
Postheelstick	1.38 (0.91)	0.34 (0.37)	0.55 (0.38)

Note. Standard deviations are given in parentheses.

tisol release in saliva than the other groups. Presenting sounds to newborn infants in this stressful situation had a calming effect, but white noise was significantly more effective in reducing behavioral indices of stress.

Both heartbeat sounds and white noise were presented to infants at 85dB, so there were no differences in physiological intensity. But we think there were differences in psychological intensity. White noise in 85dB might be a stronger stimulus for newborns than heartbeat sounds at 85dB. Sound presentation (both white noise and heartbeat sounds) might shift attention of newborns from pain to hearing, but white noise attracts more attention than heartbeat sounds at 85dB.

In the process of considering the results of the 4 studies, we found the key word to understand the data clearly: "Intensity". Intensity has been an important term in experimental psychology, for example intensity of stimuli, but it should be important in developmental psychology, too.

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