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ABSTRACT

This annual report discusses several topics related to the work of the Research and Clinical Center for Child Development at Hokkaido University in Japan. The articles are: (1) "Heart to Heart (Inter "Jo") Resonance: Taking Japanese Concept of Intersubjectivity Out of Everyday Life" (Shigeru Nakano); (2) "Intersubjectivity and Infant-Interaction: Imitation as a Way of Making Contact" (Geraldo A. Fiamenghi, Jr.); (3) "Ultradian Rhythm and Its Individual Differences in Self-Demand Bottle Feeding: Suggestions for Feeding Schedule in Group Infant Care" (Ryutaro Kaneko); (4) "A Examination of Psychometric Properties and Validity of the Toddler Behavior Assessment Questionnaire" (Emiko Kusanagi, Nobuko Hoshi, and Shing-Jen Chen); (5) "Stress of Mother during Pregnancy and Post-Partum Stages" (Kailash Tuli); (6) "Constructional Processes in the Social Interactional Activity in the Peer Groups of Japanese Nursery School Children: An Interim Report" (Kimiharu Sato and Takaharu Yuki); (7) "Development of Self-Regulation through Dialogue: Self-Assertion through Self-Inhibition" (Koichi Yamazaki, Nobumoto Tajima, and Kayoko Uemura); (8) "'Intensity' Is a Key Term in Developmental Psychology!" (Kiyobumi Kawakami and Kiyoko Takai-Kawakami); and (9) "Individual Differences in Toddlers' Emotion Regulation: The Relationship between Children's Problem-Focused Coping Style and Maternal Response Strategies to Their Negative Emotions" (Hiroko Sakagami and Toshihiko Endo). References are included with each article. (KB)

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RESEARCH AND CLINICAL CENTER FOR CHILD DEVELOPMENT

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Takashi Furutsuka, Yukari Shirotani

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HEART-TO-HEART (INTER-*JO*-) RESONANCE: A CONCEPT OF INTERSUBJECTIVITY IN JAPANESE EVERYDAY LIFE

Shigeru Nakano
Fuji Women's College

Abstact

The purpose of this article is to clarify the basic process of intersubjective relationships from a Japanese perspective. For this purpose, particular emphasis is stressed on the Japanese terms *kokoro* and *jo*, and "the space of 'we'". *Jo* (emotion) is assumed to have the characteristics that are the movement from one's *kokoro* (the mind-and-heart) towards the other's *jo* within the space of "we". With new light on those terminologies, the basic psychological units will be considerel as existing in the intersubjectivity, or the "inter-*jo*-resonance", not in an individual mind unconneced to the other. However, this is not an attempt to emphasize the cultural specificity of those terminologies, but to explore their universal features.

Key Words: *jo*, intersubjectivity, resonance, emotion, the space of "we".

INTRODUCTION

The purpose of this article is to elucidate the basic human intersubjective relationships from a Japanese perspective. For this purpose, particular emphasis is stressed on the Japanese terms *kokoro* and *jo*, and "the space of 'we'", which those Japanese words connotate. It will be discussed theoretically how this terminology can be beneficial in the understanding of human relationships. The aim, however, is not an attempt to emphasize the uniqueness of the cultural ideas implied by those Japanese terminologies, but rather to explore their universal features, emphasizing intersubjectivity.

Unfortunately, such a culturally valid approach to the understanding of the processes of human relationships has been overlooked by a large number of Japanese researchers due to the overwhelming amount of individualistic, objective methodology in modern scientific research. The discussion in this paper will be begun by considering this point.

THE GENERAL SITUATION OF "SCIENTIFIC PSYCHOLOGY" IN JAPAN

In the last several years, children's "theory of (the other's) mind" has been one of the most noteworthy research topics in developmental psychology. In Japan, a con-

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siderable number of studies related to this topic have been made. Those studies, of course, have produced some new knowledge regarding the development of the understanding of the other's mind. Nevertheless, in spite of such a great deal of effort, surprisingly little attention has thus far been given to the basic understanding and importance of daily person-to-person communication in close relationships. In addition to this, there aren't any theoretical, or positive studies which attempt to explain "theory of mind" and how it relates specifically to person-to-person relationships within the context of Japanese culture. Furthermore, Japanese researchers of theory of mind are ambiguous about the concept of mind that they adopt into their works. They seem to confuse the concept of "mind" with the Japanese term *kokoro*, which will be discussed in more detail in the next section.

A similar ignorance of our cultural background is found in studies of the specificity or the universality of Japanese culture. Kudo and Matsumoto (1996) pointed out that there are two contradictions in previous studies of Japanese emotional expression. On the one hand, anthropologists (e. g., Benedict, 1946; De Vos, 1973; Lebra, 1976) have formed culture-specific, incompatible stereotypes of the Japanese expressions; blankness like a robot and meaningless over expression. On the other hand, recent positive studies of emotional expressions in different cultures have demonstrated their universality across different cultures (Ekman & Friesen, 1971; Izard, 1971). This latter position has become prevalent among current researchers. Kudo and Matsumoto (1996) claim that whether Japanese express the same types of emotions in the same ways as Americans, French, Germans, etc. is still an open question. Harrè and Gillett (1994) also insisted, from the discursive approach, that the traditional theory of emotion is the outcome of hypotheses that limit the range of the basic emotions out of which all others are constructed. The contradictions remain unsolved. In other words, the issues of cultural specificity and cultural universality of emotion remains unsolved.

In Japanese society, emotional expression is regarded as the central cue of everyday person-to-person relations. Japanese people are expected to express their emotions differently, depending on the social relation of the partner to whom one is interacting (e. g., good friend, family, boss, stranger), or the situation socially involved (e. g., public or private). Due to the social constraints there may be more self-consciousness in the expression of emotion. But, aside from the significance within the culture, such cultural aspects of emotional expressions have hitherto been mostly ignored by Japanese psychologists. It is also a noteworthy fact that most of the studies that present the specificity or the universality of the Japanese culture were made by non-Japanese scholars.

Thus, it seems that Japanese researchers have been disregarding the gap between a vivid sense of everyday life in their own culture and the "scientific" attitude that has dominated the field of psychology. This attitude has been prevalent from the outset of psychological research in this country. Takahashi (1917), a frontier age psychologist in Japan wrote a candid excuse for the discrepancy after his argument in his book, when he said that the mind-body dualism is the only compatible idea with "scientific evidences", and that the layman's idea of "*kokoro*-body oneness (sin sin ichi nyo 心身

一如) "in everyday Japanese life cannot be matched with 'modern scientific positivism.' He admitted that a monismist can properly talk about the dualism because both ideas are just assumptions at different thinking levels; "just like that we can believe the Copernican theory as scientific knowledge, while we do the Ptolemaic theory as knowledge from everyday experiences" (p. 22: underlines are added by the author). What this statement illustrates is that the scientific approaches to the *mind* by Japanese psychologists have put the dominant Westernized research methods and the everyday life experiences of Japanese people in juxtaposition. In other words, the scientific attitudes are unrelated to their everyday life. As Kodu and Matsumoto (1996) argued, it may be the fact that this scientific disconnection to the everyday senses of life is still overwhelming Japanese psychological studies, and too many researchers, without awareness of what they are doing, are likely to follow Takahashi's point of view without even offering an excuse as he did.

MIND AND *KOKORO*

The English term, "mind" is usually translated as *kokoro* (心) in Japanese. For instance, "theory of mind", "mind's eye", "mind reading", and "to make up one's mind" will be translated into "theory of *kokoro*", "*kokoro*'s eye", "*kokoro* reading" and "to make up one's *kokoro*", respectively. *Kokoro*, however, is a more comprehensive and holistic concept, it covers both mind and heart, i.e., the whole body of the inner-state or *psyche*. The following examples will illustrate the point that the concept of *kokoro* is not substantially equivalent to that of mind:

She is a gentle-*hearted* (*kokoro*-yasasii) lady.
The handicapped were hurt by the *heartless* (*kokoro*-less) words.
I did not *mean* what I said (I said the words not with real *kokoro*).
People with any *sense* (*kokoro*) won't do such a thing.
Against her *will* (*kokoro*), she got divorced with him.
I thought that to *myself* (within my *kokoro*).
He is laughing on the outside and crying *inside* (in his *kokoro*).
The professor *knows* what's what about cooking (having *kokoro* for cooking).
I was delighted by my mother's *thoughtfulness* (expressing her *kokoro* to me).
My father did not have any *idea* who sent the letter (an idea in his *kokoro*).

As these examples show, *kokoro* has an integrated meaning of human nature different from the dualism that exists between mind and heart in Western thinking. At the same time, *kokoro* leans more toward the emotional sense of heart rather than the "rational" sense of mind. The Japanese character of *kokoro* (心), which *originated* in China, is an ideograph of the heart which was regarded as the seat for *kokoro* in ancient China and Japan. A classical and psychological theory of *kokoro* was proposed by the Zhu-zi school, one of the great Chinese Confucian philosophies founded in 12 century, which had a significant impact on Japanese classical thoughts regarding human nature. The school established the "*ri* (理)-*ki* (気)" interaction theory of the universe. *Ki* is the energy of the universe, which makes and gives anima or energy to all

beings and materials, while *ri* gives *ki* its movement, order or lawfulness. As the result of the interaction between *ki* and ri, the nature of the whole of creation and its events in the universe are made up. In *kokoro*, *ri* corresponds to *sei*(性), the disposition or nature located in the deepest level of *kokoro* within the human being; ki forms *jo*(情), the essential activity of emotion and the essence of its expression. When *kokoro* gets active, *sei* transforms into *jo* as it moves up to the top level rendered by *ki*. The Zhu-zi school assumed that all people basically have four good natures; sympathy/compassion (*jin* 仁), morality (*gi* 義), courtesy (*rei* 礼), and wisdom (*chi* 智) which comprise *sei*, but sometimes *ki* in one's *kokoro* prevents these good natures from being manifest by synchronizing with other persons' *ki* or *ki* in social and natural environments. Thus, *jo* does not express the same nature as *sei*. It composes the entire range of emotion, both positive and negative, i. e., pleasure, happiness, love, sadness, anger, hatred, and desire. Accordingly, it can be said that the nature of *jo* is considered as essentially intersubjective or reciprocal, i. e., in "inter-*jo*-resonance". Because, the expressed *jo* is always the outcome of synchronization with other persons' moods or the atmosphere surrounding us.

The direct influence of the *ri-ki* or *sei-jo* theory with regards to the concept of

Table 1 A list of the *jo* (情) lexicon.

Modifiers & their meanings		Words & pronunciation		Meaning of the words
人	human beings	人情	nin-*jo*	warmheartedness, human feelings
感	feel, perceive	感情	kan-*jo*	feelings
表	the outside, the front, the face	表情	hyo-*jo*	facial expressions
同	the same	同情	do-*jo*	sympathy
友	a friend	友情	yu-*jo*	friendship
愛	love	愛情	ai-*jo*	love, affections, tenderness
心	the-mind-and-heart	心情	shin-*jo*	the inner state, the heart
動	move, motion	情動	*jo*-do	emotion
熱	fever, heat, hotness	情熱	*jo*-netsu	passion, enthusiasm
操	operate, manipulate	情操	*jo*-sou	sentiment
景	landscapes, scenery	情景	*jo*-kei	the sight with emotional involvement

kokoro has become relatively extinct in this age. *Ki* also has lost it's theoretical significance. However, it is probably true that to pay great attention to the emotional aspect of *kokoro* is still valid in the Japanese society. To extend sympathy (doujo 同情) or kind consideration (omoiyari 思いやり) is one of the important virtues in the Japanese society. Lewis (1995) summarized the goal of Japanese elementary education as "minimizing competition and helping children develop the feeling that we're all in it together", "focusing discipline on what it means to be kind, a responsible member of the school community", etc. (p. 7). This emotion-oriented-ness of *kokoro* is incompatible with the concept of mind, in that "mind" implies a rather rational-oriented-ness like the faculty of thinking, reasoning, and acquiring or applying knowledge.

Interestingly, in Homer's age, ancient Greek people also deemed the heart (more precisely, the whole chest or midriff) as the thinking location (Broxton, 1951/1988). Thinking was regarded as being "more comprehensive, covering undifferentiated psychic activity, the action of the heart or the midriff, involving 'emotion' also"

(Broxton, 1951/1988: p. 14). It is also interesting that the Romans believed "even more than the Greeks, that the heart was important as the organ of consciousness, of mind" (Broxton, 1951/1988: p. 40). The most striking suggestion from Broxton's account of Homeric notions of the process of consciousness is that thinking was described as "speaking". People believed that a man spoke when he thought. "Deep reflections were conversations of one's self with one's mind or one's mind with one's self." (p. 12) This notion of the importance of speaking and conversations for thinking seems to have the monistic point of view when considering psychic activity and the human body. It also may have basic commonalities with the Japanese concept *kotodama*, and with Bakhtin's term "voice", as discussed later. Benjamin Franklin's words will summarize the point of the discussion here: "The heart of a fool is in his mouth, but the mouth of the wise man is in his heart."

JO AND RESONANCE

As illustrated in the previous section, *jo* is a basic figure of expressed *kokoro*, and the proto-emotion. The character *jo* (情) makes a syntax on emotional taxonomy by combining with other characters, as table 1 presents. The *jo* syntax denotes that *jo* possesses the nature to harmonize with the other's *jo*. In other words, the concept of *jo* [in this case, 情 pronounced as *nasake*] implies that we have a basic emotional motive toward the other's inner state. This character of *jo* can be explained by the notion of resonance or "voice".

Motoori Norinaga (1730-1801) was a great scholar in the latter half of 18 century, who founded the *Kokugaku* (Japanese classical literature) school. He is known by his outstanding works that re-evaluated the Japanese classical literature, "*Kojiki*", which was edited in the early 7 century from oral literature, including prehistoric mythology and folk-tales. He noticed the term "*kotodama* 言霊" (the spirit-inspeech) in the book and considered the deep meaning associated with the fact that people in the pre-writing age had the belief that a spirit dwells in speech. Namely, if one speaks out in a happy voice, or an abusive one, the spirit makes the signified come true.

Interestingly, the social labeling theory of perceived emotion (Shacter & Singer, 1962; Shacter, 1965) appears to share some similarity to *kotodama*. According to the theory, if we label our arousal states as pleasure, we are happy. Words actualize the feelings that the label indicates. Similarly *kotodama* was believed to actualize the wishes that the voices indicated.

However, it is obvious that Norinaga's consideration of *kotodama* had deeper implication for understanding of the nature of our emotion more than the social labeling theory. For Norinaga noticed the simple fact that people of old age naturally harmonize their expressions or actions to the other's "voice" communicating by resonating to the speaker's tone (Kobayashi, 1977). A nuance of the voice was considered an articulation of the movement of *jo*, that is, emotion, which is difficult to control and is often expressed unconsciously. The nuance itself has meaning as if a hidden power of the spirit dwelling in it brings the meaning into reality.

The following poem in "Ryoujin-hishou 梁塵秘抄", which is a classical anthol-

ogy of Japanese folk songs and poems collected by Imperial command in 12 century, will serve as a good example of what is meant by the resonance of *jo* :

Children are born for play, they are born for fun,
Hearing their playful voices, my body resonates with their tones.

Norinaga's notation of " voice " is very similar to the concept of " voice " as proposed by Bakhtin (1981, 1984, 1986). Bakhtin introduced the term voice to express his basic proposition that the human mind functions in a communicative practice. In other words, voice makes it clear that even personal mind activities originate in processes of social communication (Wertsch, 1991). Speech is expressed by his/her voice as a communication process. In the process, the same word can be used to express different meanings depending on certain intonations in a context. Voice is not independent from the others voice. He considered voice as not a static entity, but as a dynamic process. He insisted that meanings are created when two or more voices meet together. Such dialogic mutual activation of discourse with voice is the basic form of communication. In this process, the voice of the communication process and the voice of one's own psychological process dialogues in his/her mind. That is to say, only at the moment that a listener responds to the speaker's voice, can meaning be composed both within the person and between the communicating persons. He exemplified " parody " as this " heterogeneous voice ". The ironic and satirical sound of voice in a parody comes from the double presence of both the voice of the parodist and that of the parodied person's. In this sense, communication is the just matter of " meta-communication " (Bateson, 1972), in which words do not have the meaning that denotes the meaning. The following excerpt from free interaction in the home between ten-month-old Shiho and her mother will serve as a good example of voice-communication during playful teasing :

(Shiho and her mother are sitting together on the floor.)
Shiho : (Picks up a ball. Starts to suck and bite it looking at the mother.)
Mom : (Shows Shiho an exaggerated expression of surprise corresponding to each of Shiho's ball-biting actions.)
Shiho : (Bites the ball looking at the mother. Shows laughter.)
Mom : " Give me the ball please." (Offers her hands against Shiho.)
Shiho : (Bites it again looking at the mother. Shows laughter.)
Mom : " Why don't you want to do it ? " (Shows Shiho the more exaggerated expression of surprise.)
Shiho : (Bites it again looking at the mother. Shows laughter.)
Mom : (Repeats the exaggerated expression of surprise.)
Shiho : (Bursts out laughing.)
Mom : (Expresses laughter.)
Shiho : (Bites it again.)
Mom : (Repeats the exaggerated expression of surprise.) " Stop biting, pleeease."

In the above interaction, it can be correctly assumed that Shiho's mother did not use surprise expressions and the word "stop" as conveying their literal meanings, but her posture and intonations articulated her intention to play with Shiho in fun. Shiho expressed laughter resonant with the emotional tones of her mother's expression, that is, her *jo*.

As mentioned previously, Harrè and Gillett (1994) proposed a discursive approach to emotion and emphasized that it has transformed the psychology of the emotions to the study of discourses. They maintained that "in explaining the discursive view, it will become clear that the old theory completely misses the psychological problems of the emotions, because it fundamentally misconstrues the nature of emotions and their role in human life." (146). They pointed out that feelings and displays are to be treated as being psychologically equivalent to statements. Emotions "should not be thought of as abstract entities such as 'anger' or 'chagrin' but as actual moments of emotional feelings and displays, moments in which we are 'feeling annoyed' or in which we are 'displaying our joy' in particular circumstances in a definite cultural setting." (p. 146). An emotional feeling and the correlate display like Shiho and her mother's "joyful gestures" should, thus, be understood as a discursive phenomena, expressions of judgments in the performance of a social act. They are meaningful displays, performed according to the interactants' intentions. It is the episodes of everyday life in our culture or society, that will render us a resonant theory of emotion and display.

BEYOND THE REFLECTIVE EMPATHY

Traditionally, an ability to understand the other's feelings has been labeled as *empathy*. Empathy is defined as the vicarious sensation of someone else's emotional state or condition (Eisenberg and Mussen, 1989). In considering depressed refugees of the Kobe earthquake, we can imagine how they *felt* in the traumatic circumstances. Researchers of prosocial development have indicated the important role of empathy in prosocial behavior, especially as a key factor in altruism (Krebs, 1987; Batson, 1991; Eisenberg & Miller, 1987). In those studies, empathy has been explained along the lines of perspective-taking and distinguishing self from others. For, the researchers assumed, to share someone else's feelings, one needs to recognize that he or she is separate from the self, and to understand how things appear from his or her perspective. For instance, Hoffman (1987), who developed an influential account for a role of empathetic affect in the development of prosocial abilities, proposed four stages of it's development; a). *Global empathy* is the stage when young infants experience empathic distress as a consequence of the arousal occasioned by someone else's distress; b). "Egocentric" empathy appears after children become able to distinguish self and others, but they may still find it difficult to infer another's internal feelings; c). *Empathy for another's feelings* comes during the preschool years indicating that role-taking skills have developed, and children differentiate between others' feelings and needs from their own by being sensitive to cues about others' feelings; d). *Empathy for another's life condition* is the final stage in the development of empathy, and appears by late childhood propped by the sophisticated representational ability to reflect others' distress

or disadvantage. Hoffman (1987) viewed the development of language as the core role of this developmental process, which enables children capable of labeling the other's emotions. Hoffman's picture of the development of empathic feelings indicates that researchers of prosocial development may have assumed the process of human *social development* as proceedings towards the goal of becoming a being who can generally reflect the other's mind, context-free, and by applying learned social labels. As some studies have shown, children sometimes act according to their impressions of social desirability rather than from the heart of their empathetic feelings (Eisenberg and Mussen, 1989).

In contrast to the above notion, it has been argued that there is an inborn empathetic distress reaction to others' discomfort (Sagi and Hoffman 1976). Infants have been shown to exhibit responses to the distress of others, differentiating exactly who is suffering. Hoffman (1987) described an 11-month-old who observed a peer fall over, looked on sadly, " and then put its thumb in her mouth and buried her head in her mother's lap, as she does when she herself is hurt " (p. 51). Thus, the arising question is why infants with the preverbal ability to empathize should need language or representational abilities to express empathy as they advance in development? Does the infant' s ability to empathize disappear in the developmental process?

The answers to the above questions can be found in the inappropriateness of the reflective concept of empathy as a component of intersubjective relations. Empathy was originally constructed as an ability to project feelings that we have experienced in similar situations into a perceived object or another person (Lipps, 1903). In other words, when we extend our empathetic feeling to something or someone, we do not feel the other's feeling itself, but our own reappeared past feeling as reflected in the other, just like looking at our own image in a mirror. Thus, introspectively, the appearance of empathy depends on how we feel about the plight of the potential recipients of our concern. As Ishihara (1993) purported, the empathy theory cannot explain an excitement beyond our past experiences. Emotional experiences such as scenes of extreme cruelty that have never been seen before must be limited within the confines of an analogy to one's own past similar experience, or the result of the invitation of a fantasy which mentally constructs the situation in case. From this vantage point, researchers of prosocial development seem to be ignoring the limitations of the reflective concept of empathy in their accounts. In addition to this point, this prosocial empathy theory presupposes the existence of an individuality which may be preconditioned. A person's empathetic expression is considered an indicator according to his/her reflective or projectile interpretation of the other's distress (Ishihara, 1993). The fundamental inadequacy of this explanation is individualism.

Alternatively, Stern (1985, 1995), Trevarthen (1977, 1979, 1982, 1984, 1993a, 1993b) and others (Bråten, 1988, 1996; Hundeide, 1993; Trevarthen & Hubery, 1978) introduced the concept of intersubjectivity and argued that it organizes our social behavior from very early in life. As discussed earlier, feelings and displays are to be treated as being psychologically equivalent to statements (Harrè & Gillett, 1994). Facial expressions as well as whole body postures display our emotions towards the other subject. For instance, in an intersubjective situation, our smiles make the inter-

action with the other enjoyable. In this sense, it is certainly of social import because it is part of the processes of a relationship. Trevarthen (1982, 1993) claimed that it is simply missing the point to regard the smile as a physiological response or as an outcome of some information-processing activity. The meaning of the smile is the crucial psychological variable, and this is wholly dependent upon social context: "Only the mind of another person can be affected by a smile. To smile, effectively, an infant must understand other persons". (1982: p. 78).

As the above discussion denotes, intersubjectivity shares something in common with the concept with *jo*. However, *jo* is not limited to person-to-person relations, but is manifested in respect to inanimate "beings" one is emotionally attached to. For instance, it is often observed that mothers show a grimace when seeing their baby being given a vaccination shot on the arm. To give another example, at the moment one of my students was playing a finger-puppet, and dropped its head on the floor, she twisted her face as if "she had hit her own head." As soon as she picked it up and placed it back on its body (her finger), she patted the head in an affectionate manner trying to "banish the puppet's head pain." Ishihara (1993) described a similar experience when he felt itchy on "his cheek" as he caught sight of a poster of a famous actress with a pin in "her cheek" on the wall of a train station.

In these episodes, the mothers, the student, and the psychologist, did not, in fact feel any pain, but they obviously and actually *felt* feelings through their bodies similar to "the other", or adopting Bråten's (1988) terminology, the *virtual alter*, who had. In other words, they felt "the other's" *jo directly through their bodies*, not vicariously, as the reflective empathy theorists insist. Once again recall that Harrè and Gillett (1994) maintained that we should not think of emotions as abstract monolithic-entities. Emotions are characterized by their gradient information as described by Stern (1985, 1995), in contrast to language which is a good media to deal with categorical information. *Jo* also is not a categorical concept. If one applies it to the above episodes, they may be explained as instances in which the protagonists in the episodes were essentially motivated to express their *jo*, predicated by, and related to perceiving "the other", the "virtual other" (Bråten, 1992). In other words, they were in the "inter-*jo*-resonance."

TWO TYPES OF WORLDVIEW; THE POETIC AND THE SCIENTIFIC

Ishihara (1993) discussed that there are two types of worldview; the poetic and the scientific. The former can be called subjective, while the latter is objective and analytic. In general, poets are good examples of persons who permit *jo* to emit out from *kokoro* towards "the other" freely, and are willing to unite themselves to the settings. They are the person who have the "inter-*jo*-resonance" with "the other's" jo. On the other hand, scientists are those persons who are likely to have a tendency to inhibit expressing their *jo*, and to view things rationally. As a warning of the present situation in which psychological research is overwhelmingly monopolized by the scientific view, Ishihara's comments command our attention. Monod's (1971), who is the Nobel prize biologist in France, described a "simulated experience" in which he experienced himself as if he had become a protein molecule while he was concentrating

on his thinking. He concluded, then, that such a simulated experience must be needed for the deepest level of recognition. Only a part of it can be described with the verbal language. We should remember that we all own the power to synthesize the self in surrounding situations, *joukei* (情景, see Table 1) as a poets, even if we are scientists.

THE SPACE OF "WE"

In the Japanese language, the word (and character) 間 (aida/ma), which means the space, the room, timing, or distance, has significant connotations regarding words relating to human relations. The word that means "human being" is *nin-gen* (人間), a combination of man (*hito/nin* 人) and space (*aida/gen* 間), literally *the personal space*. The human relationship is denoted as *aida-gara* (間柄), *the space with person characters* (a physical appearance or a social status) (*gara* 柄). The society or the living world is presented as *se-ken* (世間), *the world space*. The Japanese philosopher, Watsuji Tetsuro (1889-1960) noticed this commonality and incorporated it into his theory of human relationships. According to his theory, when a man has a relation with "the other" in a society it can be explained by using the word 間 (aida/ma), the space. By extending your personal space, it will become a space including other "characters". By further extending the space, it will become the world space. He defined personal space as the place where the subject exists, then the space with characters as *the inter-subjective space*. The intersubjective space is the basic living space where subjects, within the same physical vicinity, interrelate and socially bond with each other.

Watsuji did not describe emotional interchange between subjects clearly, but in the intersubjective space, especially in an intimate relationship *jo*, as an innate quality, exists and is emitted as the central component uniting the subjects. The interactions between the subjects, will then be mutually regulated within the boundary of "we": It is as if "you feel as I feel", "we are feeling it together, or "you know this as I know it", or "*we* know this together". In other words, in the intersubjective space, subjective experience is mutually revealed, and experienced as "we". In this sense, the intersubjective space is *the space of "we"* (Nakano, 1994, 1995).

A characteristic of the space of "we" is that we cannot behave arbitrarily when we are in it. Once we have extended our *jo* to the other, or are aware of the companion's *jo* being expressed to us. We wish to confine our repertoire of actions within the boundary of what is predictable and acceptable for the other. We are willing to accord our behavior as to promote a harmonious relationship with him/her, although potentially, we still have a great degree of freedom in our range of behavior. This is in contrast to the fact that potentially, we can act just as we like in front of a person totally unrelated to us without caring about the presence of that person.

A similar idea to the space of "we" has been termed *the companion space* by Bråten (1996). According to his definition, the companion space is the proprioceptive and alteroceptive space in which the infant's bodily self is complemented by others in felt immediacy. This intersubjective phenomenological space of immediately felt experience is considered different from *the physical observation space*, available to the outside observer. He described the following incident, occurring in a summer cabin in Norway, to illustrate this distinction:

> Katharina (26 weeks) reacted to the sobbing of her sister Kine (4 years) and was felt to comfort her. They were in bed with their mother who had the baby on her stomach fingering a piece of paper. Kine was lying beside, begging for a juice bottle. She started sobbing. Katharina then stopped what she was doing, stretched her arms and leanted over towards Kine. Their faces touched. Kine began to laugh. " She comforted me " she later explained. (p. 450)

Bråten explained that " to an outside observer, unaware of Kine's comment after the episode, this incident may appear as a random or accidental incident in the observation space: unable to keep her balance, the baby fell over her sister. " But, from the point of view of the participants' companion space, another phenomenon emerges. " Lying beside them Kine may have felt excluded from the companion space shared by her mother and baby sister. Hence, her sobbing and begging for her bottle was a way of calling for attention and inclusion. When Katharina stops what she is doing and leans over towards Kine, Kine bodily feels to be included in the companion space." (p. 450). As Bråten concluded, it is not important whether or not Katharina actually sought to comfort her, Kine felt her move to be comforting, and read her intention as to comfort her. Kine's laughing indicated her excitement of feeling Katharina's *jo*, sympathy. At the same time, her laughing seems to have conveyed intimacy with her *jo*. Bråten did not describe Katharina's response to Kine's laughing, and whether or not she actually sought to comfort her cannot be unequivocally determined. However, the actions of stretching her arms and leaning over towards Kine had a significant impact. Given the quality of Kine's laughing, they seems to have represented her delight in having been comforted by her sister. Thus they both may have felt that *we* share *jo* mutually.

Actions in human interactions are substantially unpredictable. For example, parents may often feel it is difficult to interpret the cause of a baby's crying. Nevertheless, as Nakano and Kanaya (1993), Stern (1985, 1990) and Trevarthen (1979, 1990, 1993) have observed, a baby and its parent can and do effectively communicate with one another. They can, as Bateson (1979) put it, engage in " protoconversation ", as they are in the space of " we ". This fact will be given a explanatory power to the concept of the space of " we ".

CONCLUSION

Each culture may have its own vivid vocabulary to depict the special aspects of the range of emotions. These vocabularies can present clearer meanings of emotional expession rather than the English terms which are currently used as the standard language in scientific research. For instance, the mind-body problem cannot be solved as long as the dichotomy between mind and heart dominates our research. A more unified inner state can be depicted by employing the holistic terms *kokoro* and *jo*, which have been discussed in this paper. Harrè (1995), Harrè and Gillet (1994) introduced the term " emotionology ", which is a local " theory " of the nature and range of emotions as expressed through the use of specific vocabularies. *Kokoro* and *jo* are good examples of emotionology, but they, at the same time, offer a potential " universal theory "

of emotion more than a "local theory". To present the essence of emotions in communication, *jo* is relevant. The basic concept of *jo* refers to the characteristics that are the endless movement from inside of one's *kokoro* (the self *jo*) towards the outside of *kokoro* ("the other's" *jo*) and its reciprocal nature. Thus, the basic units of psychological processes exist in the intersubjectivity, or the "inter-*jo*-resonance", not in an individual mind unconnected to the other, as the Piagetian theory or recent studies on "theory of mind" have viewed.

It is time that we realize this monopolistic situation and reverse the tide of this so called "scientific" view in research to expand our understanding of human relationships more "resonantly".

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INTERSUBJECTIVITY AND INFANT-INFANT INTERACTION: IMITATION AS A WAY OF MAKING CONTACT

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Developmental psychology has traditionally assumed that young infants are born without a capacity for psychological interaction, showing only reflexes in response to the environment triggered by their internal bodily or self-regulatory needs. For example, as a result of Piaget's (1952, 1954, 1962) view of infants' developmental egocentrism, infants under one year were considered incapable of communicating with others of the same age. For many years, Piaget's ideas were prevalent and unchallenged in child developmental research.

Recently, however, these views have been questioned and some researchers have seen the infant's relationship with others as a manifestation of what is called intersubjectivity -- a psychological capacity for recognising and communicating with psychological states of other individuals.

This alternative view, in fact, is not new outside psychology. Actually, the concept of human intersubjectivity has long been the central interest in Philosophy, and in Religion.

For example, such a way of thinking was clearly articulated in Existentialism. Sartre (1970) considered that one's existence could only be 'justified' by the state of existence of the other. Without him or her, I would not exist:

> Pour obtenir une vérité quelconque sur moi, il fault que je passe par l'autre. L'autre est indispensable à mon existence. Ainsi, découvrons-nous tout de suite un monde que nous appellerons l'intersubjectivité et c'est dans ce monde que l'homme décide ce qu'il est et ce que sont les autres.
>
> (Sartre, 1970, p. 67)[2]

Buber (1947) considered the individual in relation to the other in a dialogue. For him, the relationship was "in-between" the one and the other, between two per-

[1] This paper is part of the author's Ph. D. thesis in Psychology at the University of Edinburgh.

[2] "In order to grasp some truth about myself, it is imperative that I pass by way of the other. The other is vital to my existance. Therewith, we quickly discover a world that we will call intersubjectivity, and it is within this world that man decides who he is and who others are".

sons :

> There is a genuine dialogue-no matter whether spoken or silent-where each of the participants really has in mind the other or others in their present and particular being and turns to them with the intention of establishing a living mutual relation between himself and them.
>
> (Buber, 1947, p. 19)

Although this conception of human relations is also present in the works of Bateson (1973), Bruner (1977, 1990), and Stern (1985), among others, this view of human inter-relationship has been stressed most strongly and defined through analysis of mother-infant interactions by Trevarthen (1974, 1984, 1987, 1990, 1993).

Primary intersubjectivity has been defined as the immediate experience of sharing subjective states (Trevarthen, 1979) and secondary intersubjectivity as the search for sharing of experiences about events and things (Trevarthen and Hubley, 1978)

According to Trevarthen (1993), intersubjective encounters become " psychological interactions between selves " (p. 126).

The concept of intersubjectivity is important for the comprehension of infant's development because it helps us to see the new-born as a whole motivated being, not only as a chaotic one, or one made up of reflexes. We are now beginning to understand that the infant has a mental life, that they are particularly well-equipped for social life and so that the infant is eager to become part of it. The infant is born ready for intersubjective exchanges.

We know that empathy of emotions is needed for communication because, emotion is part of the meaning that the situation has for the individual and also part of the message for the others. Empathy in the relationship between mother and infant appears to be the foundation for modulation of relationships to others that will develop afterwards. The first relationship, usually with the mother, is remarkable for the intensity with which it is affectively toned. It surely has a specially emotive and self-regulating quality for the infant (Schore, 1994).

Timing of expressions is an element that serves as a foundation for sympathetic engagement between mothers and infants. Beebe (1982) who has applied the methods of ' conversational analysis ' to mother-infant interactions shows that there is a temporal organisation, a "coaction" and turn-taking between mother and infant in their non-verbal communication. A synchrony develops between expressions of mother and child. And, surely, this synchrony is one expression of the affective bond between them. We could say that healthy communication first occurs through affection, that is, through expression of positive emotion. There is indeed a special rewarding quality, a valence, in the affection between infant and mother.

According to Trevarthen, emotions are " intrinsically generated, central, regulatory states of the brain that unify awareness and co-ordinate activity of a coherent, mentally active subject " (Trevarthen, 1993, p. 48), and " emotions also communicate between subjects ".

He believes that at 2 months, infants are involved in *protoconversations*, as a first

step towards communicative exchanges. Protolanguage, then, " requires that a child has a clear differentiation of an integrated *self* from the world of *others* " (Trevarthen, 1987, p. 182). This view agrees with Stern's point that " preverbal senses of self start to form at birth, if not before " (1985, p. 5).

The study of imitation is a method of demonstrating infants' ability to involve themselves in intersubjective interaction, because imitation is a direct indicator of sympathy between persons. It is now proven that imitation exists from birth and many researchers are exploring all ranges of mother-infant communication and infant's imitation (Maratos, 1973, 1979 ; Meltzoff & Moore, 1989 ; Nadel & Fontaine, 1989 ; Nadel & Pezé, 1993 ; Vinter, 1985 ; etc.).

Peer imitation is a new area for research that is proving the importance of a shift of interest to intersubjectivity (for example, Hanna & Meltzoff, 1993 ; Patrick & Richman, 1985). In this situation, infants are involved in relationships with strangers who are, moreover, no more developed, skilled or sophisticated than themselves.

As Hanna and Meltzoff (1993) suggest, " mutual imitation between two partners is a principal mechanism for interpersonal communication in infancy, before language. Toddlers use imitation as basic way to interact and develop social and communicative ties with one another " (p. 701).

Other authors are studying playing and teasing as a means by which both infants and their parents negotiate affective relationships (Nakano, 1994, 1995 ; Reddy, 1991). Nakano considers benign teasing a way of creating mutual amusement between mother and infant. He says that teasing is a very good example of intersubjectivity and that it contributes to the development of communication.

All of the above studies have brought new insights into the field of human development and emotion.

We have chosen infant-infant interaction as a promising research topic for the study of first intersubjective encounters.

Very few researchers have concerned themselves with infant-infant interaction. The studies that we have reviewed do not mention the quality of the intersubjective exchanges. They were more interested in the quantitative measurement of the behaviour of each individual (which is very curious, if you think that what should be considered is the dyad, not the individual).

Although those studies were not primarily concerned with interaction, they did showed the presence of some degree of involvement between the infants. For example, it has been observed that new-borns can be distressed and cry when listening to other babies' crying (Simner, 1971 ; Sagi & Hoffman, 1976 ; Martin & Clark, 1982). Others have analysed the relation between pairs of infants and toys (Vandell, Wilson & Buchanan, 1980) ; recorded the reaction to distress of peers (Hay ; Nash & Pedersen, 1981) ; and compared the interaction between mothers and that between peers (Adamson & Bakeman, 1985 ; Fogel, 1979).

In our own research, with infants of five months and older, who were seated in their push-chairs facing each other, out of contact with their mothers and without toys,

we found many interesting interactions, that demonstrate the intersubjective characteristic of awareness present in human beings from early infancy.

The infants used imitation to interact, mainly imitating partial body actions (like kicking, for example), and it seems that this is a way to call, retain the other's attention and resume interactions. It is also very frequently the cause of synchrony between their behaviours. We prefer to call this mutual engagement attunement (Stern et al, 1985) as this term emphasises the intersubjective nature of their understanding. For example, both infants at 22 weeks are looking at each other and both simultaneously move their bodies to their right, then to their left, also lifting their legs. Looking at their movement, we can see they are timed to synchronise with each other; there is a precise attunement in their actions.

If we could summarise the uses of imitation in infant-infant communication (based in our research), the result would be:

1. Pairs of infants use imitation as a means of communicating.

They can *start a "conversation of movements"* through imitative behaviour, and, as the interaction progresses, they take turns and we can observe a "conversation" occurring in the form of attuned body movements.

Take, for example, two 8-month-old infants, a boy and a girl. They have never met before and are seated on their push-chairs, facing each other. Suddenly, the boy starts to kick and the girl imitates him immediately. He kicks back and she does the same, but vocalises, smiles, points at him, who is absolutely stunned by the presence of another infant in front of him and kicks back, vocalising to her.

2. They synchronise their behaviours. As stated above, we will call this sympathetic attunement. They make the same movements with their bodies at the same time. In the above example, in one minute there were 2 imitations and 5 attunements.

3. Imitation is also used to *keep the movement-conversation going.* Consider the case of two 9-month-old infants, a girl and a boy. He kicks and holds his leg up, and she imitates him, but not with the exactly matching body movements. First, because she is not so "athletic" as he is (he can put his legs in a higher position than she can do) and second, because as he kicks, he vocalises in a long and loud way ("Tarzan-like"), while she smiles. As his attention shifts to other things, such as investigating his push-chair screws, she tries to call his attention back, kicking and moving her legs up. She succeeds, because he imitates her and emits his "Tarzan-like" call again.

4. Imitation may serve to *express recognition and sympathy.* For example, two 9-month-old infants, a boy and a girl were interacting. He looks at her, vocalises an "a-haa" sound and waves his hand, jumping in his push-chair. She smiles at him and waves back, vocalising a "uu" sound. He laughs at her and waves back again.

5. Imitation may also be used to *tease* or provoke the other. A 9-month-old boy keeps shaking a toy, holding it in front of a girl at the same age. She imitates his hand movements, and vocalises "uu", pointing as well. As she tries to reach it, he jumps and shakes the toy again, evidently finding pleasure in provoking her efforts. She also seems to be pleased, because she keeps smiling and vocalising, showing no distress that she cannot get the toy.

Imitation, then, has many different functions when infants of the same age are

interacting.

Interactions between infants were found in our study at 5 months.

In general, babies would gaze at each other, showing interest, then smile, kick, vocalise or move parts of the body. This was called an invitation for interaction, and it may or may not excite an answer -- the other infant gazes back, moves the body, smiles, kicks, or vocalises, in response. For instance, a five-month-old girl gazes at a same age boy, smiles, moves her legs up and down and vocalises. The boy gazes back very attentively, and laughs, spitting. Of course, in many cases, the invitation was not followed by an interaction. The other infant would only gaze back. An explanation for the amount of invitation behaviours that were not followed by an interaction is offered below.

We observe that, at one level there is no difference between infant-adult communication and infant-infant communication, although infants with infants interact less than infants with adults. It seems that the interactions follow certain of the same patterns. There is comparable mutual attunement, synchronised timing of behaviours, turn-taking and empathy of feelings. However, adults are certainly more efficient in creating and maintaining topics[3] (Nakano, 1995). Adults will persistently call the infant's attention, inviting with smiles and vocalisations and trying to keep his or her gaze, adopting new strategies if the infant turns away. In fact, infants under 6 months of age keep their attention on one object for a very little time. This is also true in their interactions with other infants. When confronted by adults, infants are encouraged to keep their attention to the adult by the adult's efforts. Otherwise, the infant can easily lose interest and shift attention to other things.

This belief in adults' more developed ability to create topics in communication with infants does not mean that infants are not able to interact. Infants do interact with other infants and, although their attention shifts very frequently, they can show intense interest in another infant from moment to moment.

Concluding, then, we observe imitation to be a very important means of initiating and maintaining interactions between young infants.

Interaction occurs in short (less than 5 seconds) episodes, probably because infant's attention is intrinsically unstable. Sometimes, as a result, an invitation for interaction may not be answered, but the interaction can be resumed when one of them calls back the other's attention.

Intersubjectivity, the sharing of personal expressive states, permeates all these interactive situations, setting the scene for the participants to share and learn meanings. Intersubjective engagement, allows the infants to perceive one another as human beings who try to make contact and share experiences.

Even infants under one year of age have primary experiences to share. They do this by showing body movements, laughing, making funny faces and teasing. This is a fundamental part of being human.

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[3] Topic, here, is used in the sense of an object or action of shared interest. For example, the mother can call the infant's attention by showing him or her a toy and shaking it in front of his or her eyes, smiling and vocalising.

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ULTRADIAN RHYTHM AND ITS INDIVIDUAL DIFFERENCES IN SELF-DEMAND BOTTLE FEEDING: SUGGESTIONS FOR FEEDING SCHEDULE IN GROUP INFANT CARE.

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Abstract

Self-demand bottle feeding of infants in the residential nursery was observed. In individual longitudinal records from neonates, we can see clear rhythmicity in feeding whose interval was 3-4 hours. This result showed that infants can control their feeding demands by internal rhythmicity (ultradian rhythm) in the self-demand schedule. In addition, there were individual differences in their feeding rhythmicity, such as length of feeding interval and regularity. These findings indicate significant implications to group infant care. From the point of view of caretaker-infant interactions, caretaker should feed infants based on their physical internal demands, not on external clock. We must consider a variety of infant care practices according to unique infant's physical characteristics.

Key Words: ultradian rhythm, self-demand feeding, group infant care.

INTRODUCTION

Breast or bottle feeding is central to the infant's health and development, and it provides a context for early caretaker-infant interaction. A caretaker influences infant's state and behavior through contact and nursing. Suckling is now treated as an exemplar of an interaction between caretaker and infant through which the infant obtain information about the environment (Blass, 1990).

All infants are unique individuals whose needs and physiological states vary as time passes. If caretakers sensitively respond to infant's changing physical signs, the infants could develop trust in them. Infants will find the secure base, and develop attachment relationship with the caretakers.

In group care for infants in baby homes or day nurseries, sometimes infants are left for long periods in beds without adult attention. Little or no warm interactions take place during routines. Schedules are rigid and based on clock time rather than children's physical needs. Infants must adapt to artificial schedule set up not on the basis of their physiological demands, but regulated by caregiving activity and by other cultural demands based on the average, not on unique individual.

The author has investigated individual differences in some physiological functions of

infants who were cared under the fixed-time schedule in the residential nursery, such as an urination (Kaneko, 1990a), a sleep habit (Kaneko, 1991), and an evacuation (Kaneko, 1990b, 1993). From these records, the author has suggested some problems of fixed-time schedule which did not consider each infant's physical and behavioral characteristics.

The scientific study of infant temperament originated with the New York Longitudinal Study (NYLS) by Thomas, Chess, Birch, Hertzig, and Korn (1963). Infant temperament meant the psychological reaction or behavioral style displayed in the early months of life.

The NYLS derived its infant temperament ratings from detailed interviews with parents. Nine categories were identified as follows; Activity, Rhythmicity, Approach or Withdrawal, Adaptability, Intensity of Reaction, Threshold of Responsiveness, Quality of Mood,Attention Span and Persistence, and Distractibility.

Differences in temperament shown at birth may also be factors in determining the quality of the infant's attachment to a caretaker. Individual difference in Rhythmicity, such as regular or irregular, are inevitably associated with interactional process. There are infants whose physiological rhythmicity was irregular. It may be difficult for these children to adapt fixed-time nursing schedule, caretakers cannot predict next feeding time or sleep-waking changes.

Any cycle whose period is shorter than half a day called an ultradian rhythms and about a day called a circadian one (Halberg, 1967). There are several ultradian rhythms of infants, such as sleep-waking behavior (Gesell & Ilg, 1937; Kleitman & Engelmann, 1953; Meier-Koll, et al., 1978), heart rates and behaviors in waking period (Kaneko & Torigoe, 1984), and feeding behavior (Marquis, 1941; Kleitman & Engelmann, 1953). Physiological and behavioral rhythms fluctuate day by day, change developmentally, and have individual differences. In any fixed-time schedule (clock feeding), there must be children who muladjust to these schedule.

The purpose of this study is to present longitudinal self-demand feeding data to propose appropriate practices in group infant care. A longitudinal study of an infant for many months was a suitable way of observing several endogenous rhythms and mechanisms of their interactions as they develop. Regurality of feeding rhythm in this study is situated as one subcategory of Rhythmicity.

METHOD

Subjects

The subjects of this study were 16 infants who entered the residential nursery within 30 days of age. They had no abnormalities, such as physical handicaps, premature birth, birth complications, or newborn illness.

Procedure

The residential nursery had on its roll about 40 young children who were placed into a family-like setting. A caretaker as a substitute mother took care of her charge children from neonates until preschoolers. The residential nursery organized to one baby unit and four mixed-age groups of early childhood. About ten caretakers took care of twelve to fifteen babies in this baby unit all day long under the shift work schedule.

The author, acting both as a researcher and a staff member, sought to intervene at this nursery to introduce self-demand infant care practices. So caretaking can be adjusted according to the infant's feeding and sleep-waking demands.

Infants were permitted as far as possible to select their own feeding needs. A cry was

judged as a feeding demand by skilled staff members. The time allowed for feeding was made variable to take account of individual differences in infants. Infants were permitted to nurse as long as they sucked, or until the milk supply was exhausted. But the amount of milk was restricted, because of young infant's disability to control the amount of milk. Many caretakers carried out the day and night feedings as daily schedules because of shift work schedule. Thus there was little external timing resulting from a fixed nursing routine on infants. Caretakers recorded the onset of feeding and the amount of milk. From these records, the researcher calculated the interval of feeding, total amount of milk, and a number of feeding per one day.

RESULTS

The day-chart of Fig. 1 reflects the longitudinal change of self-demand feeding during the first ten months of age for subject No. 5. Onsets of self-demand feeding are represented by the dots. At the neonatal period, the infant showed apparantly random feeding. As he wanted milk regardless time of day, there was no differences in the feeding pattern between day and night. In 3-4 months of age, he gradually needed feedings during day time and night feedings lessened. So the difference between day and night became clear, that is, the circadian rhythm has appeared. By 7 months of age, he was fed after three meals (baby food) a day,

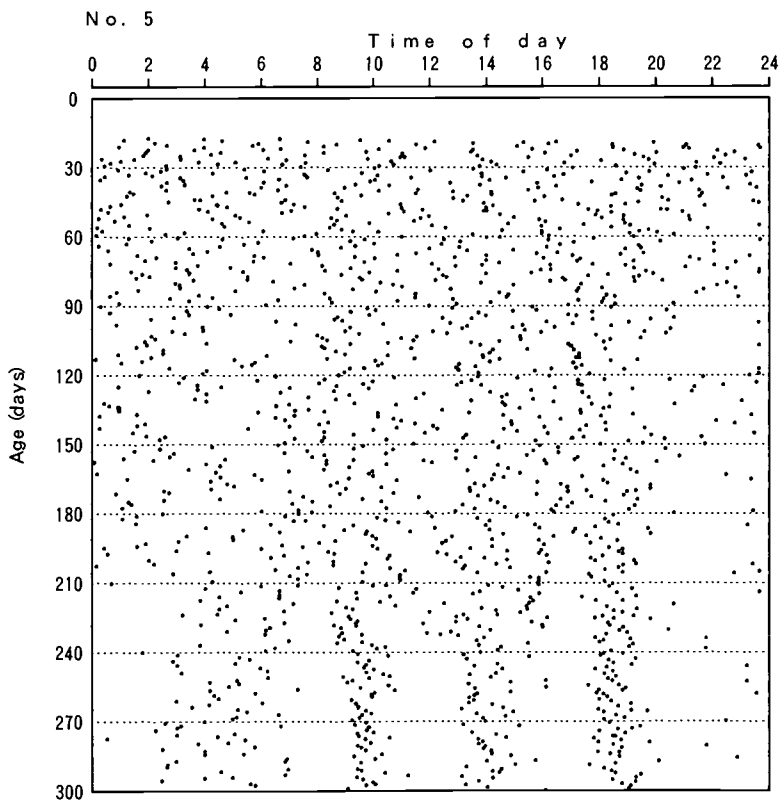

Figure. 1 Longitudinal record of feeding pattern of one infant (No. 5) from 18th to 300th day of life. The dots show the onset of bottle feeding.

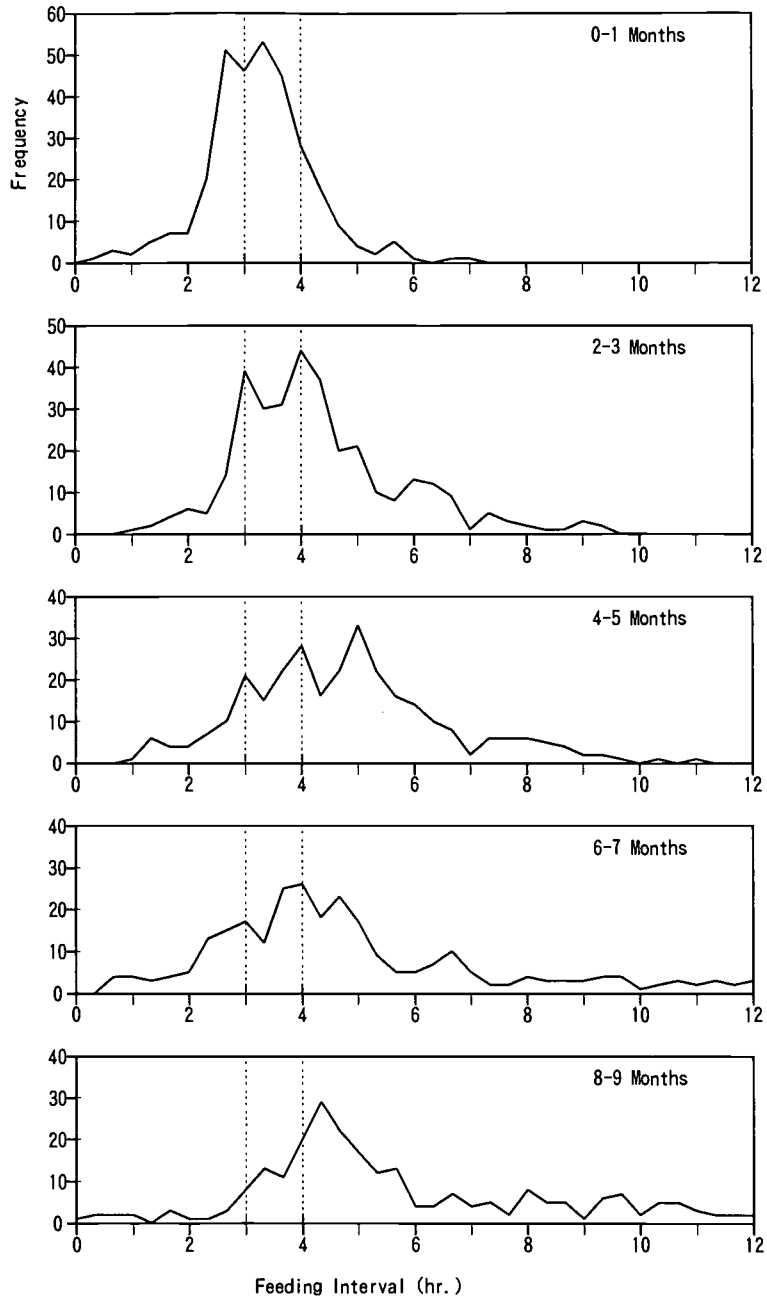

Figure. 2 Developmental change of the distribution of feeding interval from the record of Fig. 1 in each of five successive 2-month periods of observation. Feeding interval (hr.) is indicated in the abscissa, and the ordinate represents the frequency of feeding which intervals correspond to each hour.

and three feeding peak of 10, 14, and 18 hour became clear.

Fig. 2 shows the developmental change of a feeding pattern through the five successive 2-month periods of observation. In 0-1 month record, the intervals of self-demand feeding were

mainly organized according to a mean cycle period of about 3 hours. This record makes obvious that the ultradian 3-4 hour rhythm established already at early stage. Most feeding intervals for this infant were between 2 1/2 to 4 hours (mean=3 hour and 6 min.). As he grew up, this 3-hour peak became unclear, and long interval of above 5 hour increased. These long feeding intervals show appearance of long sleep. Sometimes the infant slept for as long as 10 hour without feeding. The 4- or 5-hour peak appeared from 6 months of age is not endogenous phenomenon, but it is due to the feeding schedule accompanying with three meals a day.

With all infants, the ultradian rhythm was distinct in the 4-hour range. In the age of first month, infants showed a clear ultradian rhythm. During the age of 3 months the ultradian rhythm was dominant. On the other hand, the circadian rhythm became gradually prominent. Night feeding became lessened, and feeding has gathered at day time. In the age of 4 or 5 months, the circadian rhythm became stronger, whereas the ultradian rhythm was lessening in intensity. So the distribution of interval histogram was disturbed.

There are individual differences in the length of feeding interval and regularity of feeding rhythmicity represented by standard deviation (Fig. 3). The mean interval of feedings from records of the second month of life showed individual differences ranging from 199min. (3 hour and 19 min.) to 271 min. (4 hour and 31 min.). And standard diviation of feeding interval ranged from 53.5 min. to 112.1 min.

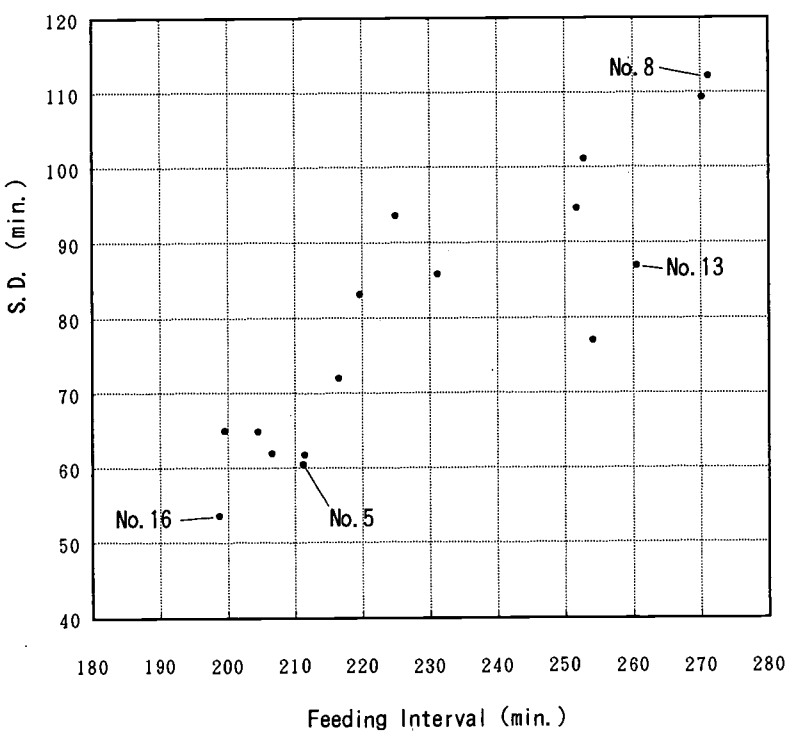

Figure. 3 Individual differences of feedings in two dimensions; abscissa is mean interval of rhythmicity (min.) and ordinate is regularity presented by standard deviation of feeding interval within 1 month record.

The upper panel of Fig. 4 shows the record of regular periodicity (No. 5, S. D.=60. 4min.). No. 5 was fed mostly between 2 1/2 and 4 1/2 hours, and showed clear frequency distribution. On the other hand, the lower data is irregular one (No. 8, S. D.=112.1 min.). No. 8 was sometimes fed with the interval of outside 3-4hour range.

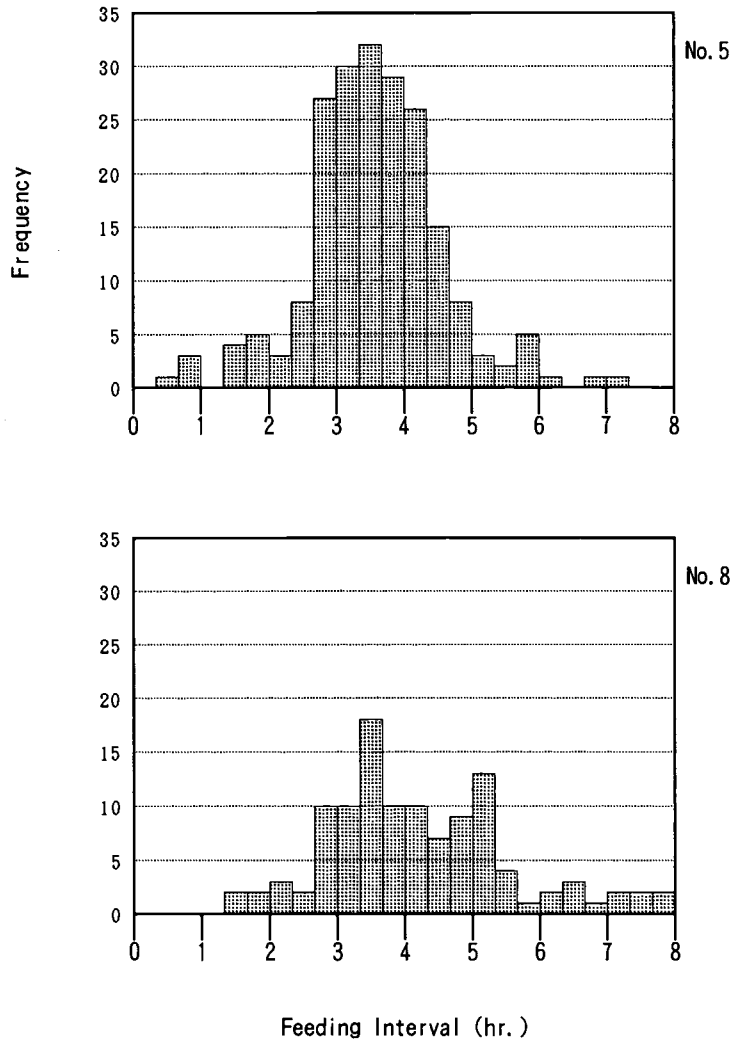

Figure. 4 Interval histogram of feedings. Each bar shows the frequency of feeding intervals of a given duration; upper panels is No. 5 who shows regular rhythmicity, and lower one is No. 8 of irregular one.

In Fig. 5, long rhythmicity (No. 13, mean=261 min.) and short one (No. 16, mean=199 min.) are simultaneously represented. But these mean intervals changed with age as shown in Fig. 2. These differences are not consistent within subject.

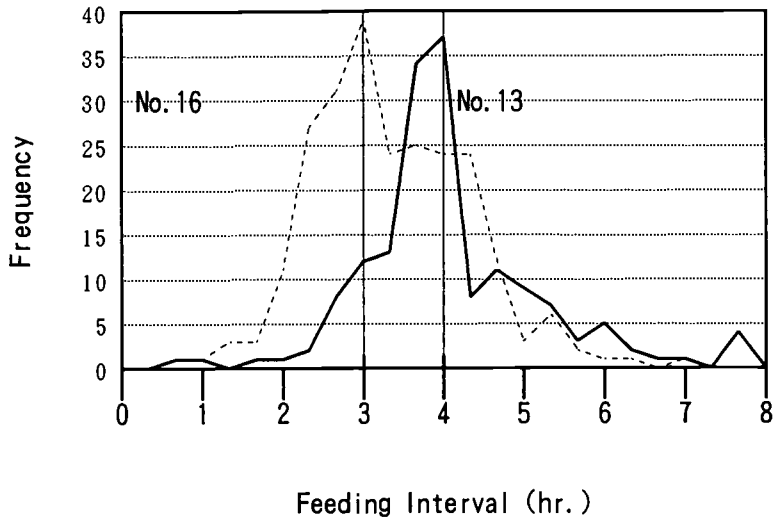

Figure. 5 Individual differences of feeding record from two infants, whose mean interval is about 3-hour (No. 13) and about 4-hour (No. 16).

DISCUSSIONS

The results of this study indicate that neonates show clear regularity of about 4-hour feeding rhythm. Neonates can regulate their feeding demands by internal rhythmicity. This phenomena was previously shown by Marquis (1941). And this ultradian 4-hour cycle is independent of the degree of hunger. There was no correlation between the length of the feeding intervals and the amount taken at the subsequent feeding (Marquis, 1941).

Gesell and Ilg (1937) were the first to describe that human newborns woke and slept according to about 4-hour periodicity under self-demand feeding schedules. Furthermore, Emde et al. (1975) demonstrated that a 4-hour sleep-waking rhythm was already established at birth and did not depend on the degree of hunger. The prepotence of about 4-hour ultradian sleep-wake cycles regulates feeding rhythms, making most feeding intervals to be about 4 hours. Ultradian sleep-waking rhythm is important in determining the length of the time between feedings. As the ultradian rhythm signifies apparantly primitive rhythm, a longitudinal analysis from neonate seemed significant.

Both the circadian rhythm as well as the ultradian one underlie the spontaneous sleep-waking behavior. The circadian rhythm gradually developed during the first 6 months as shown in Fig. 1. The coupling of the ultradian 4-hour cycle with the circadian 24-hour rhythm may be the actual mechanism underlying the self-demand feeding. Both rhythms do not run independently, but seem to constitute a system of connected oscillators. The frequency of the ultradian cycle seemed to be modulated according to a circadian variation (Meier-Koll, *et al.*, 1978). So, this rhythm fluctuates day by day, changes developmentally. As was known previously, the mean number of feedings per day, starting out with about seven, dropped to about five by 3rd month (Kleitman & Engelmann, 1953). The decrease in the number of feedings was due mainly to the elimination of the night feedings.

As a practical implication, these temporal structure by the ultradian and the circadian

rhythm could be taken into account in adapting caregiving of infants. For example, in a strict 4-hour feeding schedule, the infant who has 4-hour periodicity such as No. 13 (Fig. 5) may adapt easily, however, it may be difficult for another infant of 3-hour periodicity (No. 16, Fig. 5) to do so. In addition, caretakers' demands for adaptation to any fixed-time feeding schedule seem difficult for the arrythmic infants (No. 8, Fig. 4). Irregular infant may induce negative reactions in the caretakers. As Thomas *et al.* (1982) suggested, the many demands on the irregular infants for adaptation- sleep-waking and feeding schedules, etc. -seemed to be difficult and stressful for therse youngesters. It may be reasonable for caretakers to nurture these arrhythmic infants without using a clock.

The notion of the child as an active agent from birth requires that the influence of the child on the caretaker is considered as well as the influence of the caretaker on the child (Thomas, *et al.*, 1963). Caretakers who fail to acknowledge infant temperament are liable to make errors in their handling. Caretaker's advice on routine care practices must be flexible enough to allow for the variety of infants to whom it will be applied (Carey, 1972). Whatever the infant care practices, most infants would be able to adapt them, however, there were small proportion of children who fail to adapt with even any types of child care practices. So, no general rule of infant care practice would be appropriate for every child (Thomas, *et al.*, 1963).

From the findings of this study, the concept of Rhythmicity which is one category of infant temperament can be understood more concretely. This findings may be helpful for infant care practice. Feeding patterns differ intra-individually as well as inter-individually. So it is necessary for caretakers to do practice flexibly according to infant's characteristics, adaptability, or constant fluctuations and developmental changes.

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An EXAMINATION OF PSYCHOMETRIC PROPERTIES AND VALIDITY OF THE TODDLER BEHAVIOR ASSESSMENT QUESTIONNAIRE

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ABSTRACT

The Toddler Behavior Assessment Questionnaire (TBAQ) developed by Goldsmith was examined in terms of psychometric properties and validity: distribution of answer for each item, internal consistencies and discriminant properties of temperamental scales, and each convergence between maternal, paternal scales and laboratory measures. Although a few items were inadequate in distribution of answer, most items were found to be able to discriminate among Japanese children effectively. All scales proved to have high internal consistencies and acceptable discriminant properties. Concerning validity, there were low to moderate degree of agreement between mother and father report, and moderate convergence between maternal reports and laboratory measures only for Social Fear scale.

Key Words: temperament, questionnaire, validity, toddler.

INTRODUCTION

Since Alexander Thomas and Stella Chess initiated a longitudinal study of the implication of individual differences in temperament for psychological adaptation, the New York Longitudinal study (NYLS) (Thomas et al., 1963), there has been considerable interest among psychiatrists, developmental psychologists, and pediatricians in the study of temperament. More recently, researchers have begun to address the issue of influences of temperamental differences on the following areas; childhood social development of empathy, conscience and guilt (Eisenberg et al., 1996; kochanska, 1991, 1993; Rothbart et al., 1994) ; adolescent personality traits (Caspi & Silvia, 1995), behavior problems (Caspi, Henry, McGee, Moffitt, & Silva, 1995), and life course adjustment (Lerner et al., 1988).

Whilst temperament research has increased dramatically, a series of reviews have repeatedly pointed to theoretical and psychometric problems (Goldsmith & Rieser-Danner, 1990; Hubert et a., 1982; Slabach et al., 1991; Rothbart & Mauro,

The authors wish to thank Professor Hill Goldsmith and Ms. Kathy Lemery of the University of Wisconsin for help in this research. Correspondence concerning this article should be addressed to Emiko Kusanagi, Faculty of Education, Hokkaido University, Nishi 7, Kita 11, Kita Ku, Sapporo 060 Japan.

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1990; Windle, 1988). Although the most popular form of temperament assessment in infancy and childhood is the parental report questionnaire, the typical questionnaire has been developed without sufficient attention to well established psychometric principles (Lerner, 1983). Some of these problems have been associated with the NYLS framework that is most widely used in temperament study. For instance, concerning the theoretical problems, Goldsmith and Campos (1982) have argued that the definition of temperament as "behavioral style" may apply to some of the NYLS dimension (e.g. Intensity), but that other dimensions are actually description of the content of behavior (e.g, Approach/Withdrawal). A series of reports of factor analysis of questionnaires that were developed by Carey and his associates according to the nine dimensional NYLS model, also call into question the theoretical assumptions underlying the NYLS approach. According to the result from a factor analysis of the Revised Infant Temperament Questionnaire (RITQ) with a sample of over 2400 Australian infants, although two dimensions emerged as relatively pure factors, the other factors were formed from various combinations or divisions of the NYLS dimensions (Sanson et al., 1987). Similarly in Japan, factor analysis of RITQ and Toddler Temperament scale (TTS) with a representative sample of 817 (RITQ) and 615 (TTS) children provided limited empirical support (Sugawara, 1994). The TTS is quite similar to the RITQ in format, with content changed slightly to make the items appropriate for the 12-to 36-months age range (Fullard et al., 1984). The Middle Childhood Temperament Questionnaire (MCTQ) for 8 to 12 year old children and the Behavior Style Questionnaire (BSQ) for 4 year old children also did not confirm the nine dimensions of NYLS (Buss & Plomin, 1984; McClowry et al., 19930). These consistent failure to duplicate the nine dimensional NYLS model suggests that it may be the theory rather than the instrument that is at fault (Slabach et al., 1991). As naturally expected, poor discriminant validity and low internal consistency of temperament scales occur more frequently in questionnaires developed by Carey and his associates (Goldsmith, Rieser-Danner, & Briggs, 1991; Slabach et al., 1991). Internal consistency estimates were below. 70 for about half of the scales (Guerin et al., 1994; Fullard et al., 1984).

Failure to appropriately measure temperament constructs sometimes leads to an unfortunate need to reassess the validity of an entire body of literature using inappropriate instrument. If we could not find a relationship between a temperament dimension and future social development that is theoretically expected to relate each other, it would not be clear whether the fault lies with the false expectation or with the inappropriate measurements. Research in behavioral sciences often succeeds or fails depending on the quality of its assessment instruments (Goldsmith & Rothbart, 1991). Unfortunately, in Japan, the most widely used questionnaires are those developed by Carey and colleagues. We need to have psychometrically adequate measures of temperament.

Previously, we reported about the psychometric qualities of Rothbart's Children's Behavior Questionnaire (CBQ) (1988) that is developed for use with 3-7 years old children (Kusanagi, 1993b). As a result, the CBQ is found to have strong psychometric properties except a few scales. The companion instruments of the CBQ are Infant Behavior Questionnaire (IBQ), the Toddler Behavioral Assessment Questionnaire (TBAQ), and so on (Goldsmith & Rothbart, 1991). In this report, we examined the

psychometric properties and validity of the TBAQ constructed for 18-24-month old children by Goldsmith (1996).

Goldsmith & Campos presented their theoretical approach that defined infant temperament as the set of characteristic individual differences in the intensive and temporal response parameters of behavioral expression of affect-related states (Goldsmith & Campos, 1982). According to our results of temperament study using laboratory assessment, individual differences in positive emotion (joy/pleasure), anger, and fear are independent of each other (Kusanagi, 1993a ; Hoshi et al., in press). the TBAQ is the only toddler questionnaire that captures positive emotionality independently of negative emotion and two negative emotionalities independently. The TBAQ measures temperamental dimensions of Activity Level, Tendency to Express Pleasure, Social Fearfulness, Anger Proneness, and Interest/Persistence. Utilizing 1,012 records, Goldsmith (1996) constructed the TBAQ by an iterative process of item generation intended to ensure content validity, by repeated item analysis focused in internal consistency and discriminant properties, and by scale revision. As a result, internal consistency reliability estimates typically exceeded .80 for each scale.

The psychometric qualities of the TBAQ were addressed in terms of three fundamental properties of scale and items in this report. First, the distribution of answers was examined for each item to confirm whether each item discriminated the subjects effectively. Second, coefficient alpha for each scale was computed in order to examine internal consistencies of the TBAQ scales. Finally, the intercorrelations among scales were computed to examine the discriminant properties of each scale. Interscale correlations are desired to be low. For the TBAQ, however, significant correlations were found among temperament scales.

The validity of the TBAQ were explored in terms of convergence between the maternal and paternal TBAQ scales, and convergence between the parental TBAQ scales and laboratory measures for three emotionalities. Thus far, for interparental agreement, moderate and highly variable relations appear to be the norm (Slabach et al., 1991). The degree of convergence between questionnaire and laboratory measurement was also reported to be moderate (Goldsmith & Rieser-Danner, 1990). In order to measure behavioral aspects of temperament, we used the locomotor version of Laboratory Temperament Assessment Battery (LAB-TAB) (Goldsmith & Rothbart, 1991). The locomotor version of LAB-TAB is designed by Goldsmith and Rothbart to make available a standardized instrument for laboratory assessment of temperament for 12- and 18-month-old without unusual or expensive equipments. Their first results suggested promising psychometric properties for the locomotor version of LAB-TAB (Goldsmith & Rothbart, 1991). The temperamental dimensions covered by LAB-TAB include Activity Level, Fearfulness, Anger Proneness, Interest/Persistence, and Joy-/Pleasure. In addition, we examined the agreement of laboratory measures with the mother's predictions about her child's behavior in laboratory settings to explore the ecological validity of LAB-TAB.

METHOD

Subjects :

Mothers whose children were about 18 month old who visited three health centers in Sapporo City for physical check-up were asked to complete the TBAQ. Some questionnaires were sent to mothers by mail from two health centers before physical check-up, and were collected when they visited the health centers. The rest of the questionnaires were handed to mothers at the third health center on visiting days, and were returned by mail. Return rate were 65.9% and 70.1% for the former, and 22.5% for the latter. A total of 483 mothers filled out the TBAQ. Among their children, 258 were boys and 222 were girls, and 3 children were not known in terms of sex. The age distribution of their children is presented in Table 1. There were three children whose age were not known. Approximately 20% of mothers of those that completed the TBAQ have agreed to participate in the laboratory study. Finally, we randomly

Table 1 Distribution of subject's age (N=480)

	Age				
	16 Months	17 Months	18 Months	19 Months	20 Months
Number of Subjects	2	84	378	14	2
%	0.4	17.4	78.4	2.9	0.4

selected 50 pairs of mothers and their children (23 boys and 27 girls) for laboratory assessment. Their average birth weight was 3129g, and all children were free of serious birth complications and congenital anomalies. Before the mother and her child left our laboratory, we gave the mother a self-addressed envelope and asked her to persuade the father to complete the questionnaire and send it back by mail. Thirty four fathers of these families have responded to the TBAQ.

The Toddler Behavior Assessment Questionnaire:

The TBAQ is comprised of 111 items that combine situations and responses theoretically postulated to be relevant to the target dimension. Several considerations were given to avoid the rater biases: (1) stating items clearly and simply; (2) minimizing the possible effects of social desirability by avoiding biasing language and using the strategy of asking the respondents to report the frequencies of discrete behaviors during a recent, specified time interval rather than making global judgements; and (3) disrupting possible response sets by reverse keying items. All items were directly translated into Japanese, except one item in which the name of a TV program ("Sesame Street") was deleted in the Japanese translation. Mothers or fathers were asked to indicate how often their children did the behavior described during the last month by circling one of the numbers. Numbers ranged from 1=never, through 4=about half the time, to 7=always, with X=does not apply (meaning, "I did not see my child in this situation"). Scale scores for the TBAQ were computed by summing all numerical item responses for a given scale. When a mother omitted an item, or checked the "does not apply" response option for an item, that item was not included.

The locomotor version of the Laboratory Temperament Assessment Battery:

The LAB-TAB is comprised of the 20 episodes, four per dimension, that are

used to assess temperament. We used a subset of the episodes to measure three emotionalities and Activity Level. We selected the following episodes; "Cognitive Assimilation Game (train)", "Modified Peek-a-boo Game", and "Reaction to Sound and Light Display (Simon)" episode for Joy/Pleasure; "Stranger Approach" and "Remote Controlled Toy" episodes for Fear; "Gentle Arm Restraint by Parent" and "Attractive Toy placed behind Barrier" episodes for Anger; and "Free Play" episode for Activity Level. The details of each episode procedure is described in the LAB-TAB.

According to Goldsmith & Rothbart (1991), we employed several practices to minimize carryover effects from one episode to another. We began with a nonstressful episode drawn from the Pleasure domains, and we avoid consecutive, potentially stressful episodes in the same room. We interspersed Fear and Anger episodes, and positioned the free play episode midway through the laboratory session. When the child became distressed, the next episode was resumed only after the child became soothed.

The laboratory sessions were videotaped, and rating were made from the replay by two raters. Five children were excluded from the analysis, as they became too distressed in more than four episodes. Following the guidelines for scoring the LAB-TAB, the longer episodes are typically divided in shorter intervals called epochs. Within each epoch or trial, a number of infant responses, such as smiling, reaching, or crying, are scored. Sometimes the presence or absence of a response is simply noted; however, more often parameters of the response, such as latency, duration, and intensity, are scored. The scoring is straightforward and subjective judgments were avoided as much as possible. Analysis for Activity Level of the LAB-TAB has not been performed yet, and was not reported here. Concerning the analysis of fear, in this report, we used data of only "Stranger Approach" episode, because the Fearfulness scale of the TBAQ is conceptualized as social fearfulness. "Reaction to Sound and Light Display (Simon)" episode was not utilized in the analysis, as about half of the children either did not express pleasure or displayed ambiguous expression. This episode seems to be inappropriate for eliciting Joy/Pleasure for Japanese children.

In terms of coding fear expression, when crying was observed, it was difficult to assess the expression using only fear coding system in the Affex (Izard et al., 1983). If his/her cry is interpreted as being due to fear, We assessed the expression using both coding system of distress and fear in the Affex, and adopted higher score of the two. As many children expressed intense distress at the epoch of being picked up and held in the "Stranger Approach" episode, we analyzed epochs before this for the peak of this measure. The parameter in which more than 80% of children had the same score was excluded from the analysis. The following are excluded parameters; The duration and latency of facial expression, and the duration and latency of bodily expression of fear ("Stranger Approach" episode); and the latency of bodily expression of anger ("Attractive Toy placed behind Barrier" episode).

All parameters were standardized before statistical analysis. Composite score of each episode was created by using the average of standardized scores except those which had not significantly positive relations with some of the other scores. Next, we

synthesized the higher order composite of each emotion by averaging composite score of episodes related to each emotion. This composite score of each emotion was used in the examination of the validity of the TBAQ.

To calculate interrater reliability, two well trained raters independently scored 10% of episodes that were selected randomly. The percentages of agreement between two raters were higher than 89% for all measures.

Following Goldsmith and Rothbart (1991), we administer a brief structured interview with the mother during warming up period prior to the LAB-TAB episodes. The

Table 2 Mean, Standard Deviation, Standard Error of the Mean, Actual Range of Scale Scores, and Cronbach's Alpha Estimates of Scores for Temperament Scales

Scales	Number	Mean	S. D.	S. E. M.	Actual range of scale scores	Alpha Estimates
AL	20	4.642	.669	.030	2.70-6.45	.85
PL	19	5.466	.687	.031	3.16-7.00	.92
SF	19	3.956	1.061	.048	1.08-7.00	.83
IN	22	4.076	.818	.037	1.22-6.21	.90
AP	28	4.060	.764	.035	1.92-6.21	.86

AL=Activity Level; PL=Pleasure; SF=Social Fear;
IN=Interest/Persistence; AP=Anger Proneness.

mother was explained about the episodes and was shown the pictures of the stimuli used at the episodes. Following this, we elicited her predictions about how her child would respond to the impending laboratory episodes on a 4-point scale (Definitely Yes, Probably Yes, Probably No, Definitely No). We calculated the average of rating scores for each episode, and then averaged them for each scale.

RESULTS

1. *Distribution of responses for each item*

The distribution of responses was checked out for each item. Seven items were marked " dose not apply " by more than 50% of the subjects. These items seem to be inappropriate for Japanese children. For example, at item that " When you were going out and your child did not want to stay with the regular sitter, how often did s/he pout or frown? ", the percentage of " does not apply " was 80.1.

Nine items yielded same score by more than half of the mothers. For example, concerning the item that " When being tossed abut playfully or wrestled with, how often did your child smile? ", 67% mothers replied that their children always smiled.

2. *Internal consistencies*

Table 3 Intercorrelations of TBAQ Scales (Pearson)

	AL	PL	SF	IN
PL	.18**			
SF	−.07	−.25**		
IN	−.22**	.23**	−.03	
AP	.36**	.14*	.25**	−.07

* $p<.01$, ** $p<.001$

The mean, standard deviation, standard error of the mean, range of scores, and a measure of internal consistency, coefficient alpha for each scale are shown in Table 2. The alpha ranged from .83 to .92, with a median of .86. The Pleasure scale evidenced very high internal consistency reliability (.92).

3. *Discriminant properties*

Intercorrelations across temperament scale scores are reported in Table 3. Seven of the ten interscale correlations were found to be significant. Activity Level scale was found to have moderate, positive correlation with Anger Proneness scale (r=.36), and modest, negative correlation with Interest scale. Pleasure scale showed low correlation with all the other scales. Among these, only correlation between Pleasure and Social Fear scale was negative. Two negative emotionarity scale (Anger Proneness and Social Fear) were positively interrelated. Social Fear scale did not correlate with either Interest or Activity Level scale. The relation of Interest scale with Anger Proneness scale was near zero.

4. *Correspondence of TBAQ maternal report with TBAQ paternal report and maternal interview*

Low to moderate correlations for parental agreement on the TBAQ were obtained (Table 4). There was moderate but significant agreement for Activity Level and Anger Proneness scale. Parental agreement for Interest/Persistence scale tended to be significant. It was evident that mother-father agreement for Pleasure and Social

Table 4 Correlations of TBAQ Maternal Report with TBAQ Paternal Report and Maternal Interview (Spearman)

TBAQ Scale		Interview
Maternal	Paternal[a]	Maternal[b]
AL	.48**	.27+
PL	.21	.14
SF	.28	.25+
IN	.31+	—
AP	.46**	.20

**p<.01 +p<.01

[a] N=34

[b] N=50 for Activity, Pleasure & Anger r's, and 48 for Fear r's

Table 5 Correlations of Laboratory Measures with TBAQ Parental Report and Maternal Interview (Spearman)

	TBAQ Scales		Interview
Laboratory	Maternal[a]	Paternal[b]	Maternal[c]
PL	.18	−.07	.39**
SF	.33*	.23	.35**
AP	−.06	−.06	.27+

** p<.01, *p<.05, +p<.01

[a] N=45 for Pleasure & Anger r's, and 40 for Fear r's

[b] N=30 for Pleasure & Anger r's, and 27 for Fear r's

[c] N=45

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Fear scale was modest, but not significant.

There were modest correlations between maternal TBAQ report and interview. For Activity Level and Social Fear, agreement tended to approach significant level.

5. *Correspondence of laboratory measures with TBAQ parental report and maternal interview for the emotionality scales*

Correlation between maternal report on the TBAQ and the LAB-TAB measure was found to be significant only for Social Fear scale. The other correlations were very low or near zero. Correlations between laboratory measures and maternal interview concerning her child's reaction in the episode were low to moderate. For Pleasure and Social Fear scale, correlations was significant. For Anger Proneness scale, correlations tended to be significant.

DISCUSSION

The purpose of this study was to examine the TBAQ as developed by Goldsmith. He had made efforts of constructing scales that were theoretically grounded, conceptually independent, inclusive of varied facets of each temperament construct, internally consistent, and empirically distinctive. Concerning the distribution of answers, some items were found to be inappropriate for Japanese children. Many of them seemed to be due to the differences of child rearing practices between Japan and America. In Japan, when the mother goes out, it is rare that her child stay with the baby sitter. Although items that elicited highly skewed distributions of responses were eliminated in constructing the TBAQ, some items demonstrated such a distribution of responses in Japan.

According to a report by Goldsmith (1996), estimates of alpha were high for the scales of the TBAQ, ranging from .86 to .89 with the largest sample of 18-month-old. In this report, estimates of internal consistency attained high levels for all temperament scales. In general, measures of internal consistency are of moderate magnitude for temperament questionnaire (Hubert et al.,1982; Slabach et al., 1991). Estimate of internal consistency of the TTS used widely in Japan are low: alpha range=.56 to .71, median =.62 (Sugawara et al., 1994). Alpha estimates obtained in this study are of the highest magnitude among temperament questionnaires for toddlers.

Although temperament scales of the TBAQ are designated to be conceptually independent and empirically distinctive, Goldsmith and his associates take the view that interscale correlations should be low but not necessarily near zero (Goldsmith & Rothbart, 1991; Goldsmith,1996). He noted that forcing zero intercorrelations is likely to make scale content unduly narrow. For example, they thought that Activity Level and Anger Proneness should be positively related simply because expression of anger often involves movement and arousal. Actually, this relation was found and was the strongest relation of all in the present study. The other correlations among the TBAQ scales were found to be similar to those reported by Goldsmith. There was a inverse relation between the Pleasure and the Social Fear scales. This seems to imply that broad hedonic tone may affect the responses as suggested by them. The expressions of pleasure and interest were positively correlated, and is interpreted by them as being due to the fact that expression of pleasure depends on engagement with the environment

and/or Interest/Persistence taps a milder aspect of a broad hedonically positive dimension. Pleasure also correlated positively with the Anger Proneness and Activity Level scales, for which high scores imply substantial behavioral activation. The evidence that the Social Fear scale was related with the Anger Proneness scale is inconsistent with our results in laboratory experiment (Kusanagi, 1993a; Hoshi et al., in press). Mothers may not be able to properly discriminate both negative emotions. Given that the correlations described above were low and explicable, the discriminant validity of the TBAQ seems to be acceptable.

One of the weakest aspects of parental rating is indexed by estimates of parental agreement (Martin & Halverson, 1991). The degree of parental agreement in this study fell within the range noted in the reviews of the temperament literature (Bate, 1987; Goldsmith & Rieser-Danner, 1990; Hubert et al., 1982; Slabach et al., 1991), and tended to be somewhat lower than those of the TBAQ reported by Goldsmith (1996). Some potential reasons why the degree of interparental agreement is low were suggested by researchers as follows: problems in adequacy of wording of scale items or instructions; rater response sets; differential weighting of rarely occurring child behaviors; differential amounts of contact leading to different ratings; different conceptual schemes used by different raters when evaluating specific child behaviors; the possibility that the child is displaying different temperaments for different individuals; differential influence of nontemperamental child characteristics to the temperament ratings of mothers versus fathers (Hubert et al., 1982; Slabach et al., 1991). As the level of agreement for scales that tapped active motoric behavior was found to be higher than the other scales, these more overt and noticeable aspects of temperament might elicit stronger consensus level among parents. It was demonstrated that the correlation between mothers and fathers on the IBQ Distress to Limitations (frustration/anger) scale was the highest of all scales (Goldsmith & Campos, 1990).

The evidence that there were significant, moderate relations between the laboratory affect measures and mother's interview-based predictions suggests that mothers are able to predict and rate their children's behaviors appropriately in a specific situation. Laboratory measures, however, did not evidence the relations with maternal TBAQ measures except the Social Fear scale. Maternal TBAQ scales showed only modest relation with the maternal interview measures. The first possible explanation of poor laboratory-questionnaire convergence is that the LAB-TAB settings may be different from situations where the mother was asked about the child's behavior in the TBAQ. Hagekull and his associates (1984) demonstrated that when observation were limited to situations specified by the parental rating instrument, validity coefficients were high. The second possibility is that strange laboratory rooms elicit too much tension for the child to express pleasure and/or anger as he/she might usually do. The third explanation is that reliabilities of laboratory measures may be questionable, as our laboratory measures of each dimension derived from one or two episodes. In home observation study, about six to eight observations are necessary to reliably measure the temperament dimensions (Sifer et al., 1994). It seems to be necessary to further examine the ecological validity and reliability of the LAB-TAB procedures for Japanese children.

To summarize, the TBAQ seems to have strong psychometric qualities, but yielded limited support of convergence with the laboratory measures.

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STRESS OF MOTHER DURING PREGNANCY AND POST-PARTUM STAGES

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Mother-child relation is one of the most remarkable biological, psychological, social and inter-dependent relation existing in the sphere of human bondage and social matrix. The paramount importance of the relation is not only from the fact that it is the basis of continuation of human race but it is what makes a future human being in terms of his/her personality, value system, citizen and mental health etc. The efforts on the part of the mother to bring up the child from the stage of conception to growing up him/her in a state of fully biological autonomous system is a long process and not without paying the cost in terms of time, energy, psychological, emotional and social price. The whole process is not just a smooth transition but is a path in which price has to be paid in unusnal type of currency.

Pregnancy is a unique period in the life of a woman. The latest researches are not very far off when the woman may produce child without sexual intercourse and even artificial insemination. Biotechnology is on the brink of such achievements in which mother's ova and father's sperm could meet, without mating or even seeing each other and the baby may have his/her embryonic period in complex chemicals and tubes in the laboratory. Scientific achievements are accelerating at astounding speed. However such mind boggling researches may not become a common practice with people in all cultures of the world. Millennium Three has many such wonders in its sleeves that would be unfolded in future history of humankind.

In modern times, the numerous pressures on the human life make it a stressful experience so much so that life becomes a sickening experience. Procreation is considered a very gratifying experience by the women but the other factors have made it different than a simple biological experience. Period of pregnancy brings various other problems associated with life, which are not merely biological but social, cultural, economical, political and psychological in their content. These problems are surmounting and can be potentially stressful. Before I discuss them with elaboration I would like to make the concept of stress clear. Basic concept of stress remains same, though it may be applied in various contexts.

STRESS AND MOTHERHOOD

Reber (1985) defines stress as, "Generally, any force that when applied to a sys-

tem causes some significant modification of its form, usually with the connotation that the modification is deformation or distortion. The term is used with respect to physical, psychological and social forces and pressures." Stress can both be cause and effect. In psychology it is usually taken in the sense that it is an external demand on the organism and if the organism is not capable of coping with stress then it may have to pay the price in terms of physiological malfunctioning.

In the present paper author is exploring the stresses of the mother during and after pregnancy. In fact this phenomenon is not culture free. It would be found out that pregnant mothers have different problems in different cultures. Whiting (1963) shows that child rearing practices are quite different in diversified cultures. This book explores six cultures viz. Kenya, India, Okinawa (Hawaii), Mexico, Philippines, and USA. Pregnancy, child rearing practices and other cultural aspects related to upbringing have been examined by different investigators in the actual field setting researches. For example in Indian context (pg. 313), it is written, " Particularly boys who have been born after several years of barrenness or after the death of several children, may be accorded more attention....When baby cries adult response is fairly prompt " That is just to highlight that how mother-child interactions can have different shade in a particular cultural backdrop.

Pregnancy is a universal phenomenon and so is the stress. But it does not imply that period of pregnancy is universally stressful. Pregnancy needs to be viewed through the lens of culture. For example a teen age mother maybe excited on being pregnant in USA even if she is unmarried, while in the similar circumstances an Indian unmarried teen aged mother may harbour the thoughts of suicide. On the contrary if she (Indian girl) is married and pregnant then she may get a very respectful treatment from her family members. The birth of a child out of wedlock is biologically a perfect phenomenon but socio-culturally a problem situation in many societies of the world. Musick (1993), quotes, " Although young mothers may initially say they were very upset to find themselves pregnant, later as they come to know you better and trust you more, they often change their story, conceding that they are glad to be having a baby."

Motherhood is a universal process and pregnant mothers usually undergo that experience in their cultural context. Mothers are subject to stress of various dimensions of cultures in which they live or later on nurture and rear their children. These stresses may not be even stress for many, because in most of the cultures the rewards of being pregnant outweigh the stresses of motherhood. Most cultures have premium, valuation and respect for the pregnant mothers as it can be seen in the reflection of health care programs of a country for such mothers. However, the following kinds of stresses may be observed in pregnant mothers.

BIOLOGICAL ASPECTS

Biological stresses are associated with the physiological changes and other associated fears. For the mother it is a unique phase of life. Prior and gained knowledge

determines the anticipated stress and fears regarding pregnancy. In this context it is vital that whether it is first, second, third or nth pregnancy. That amounts to experience in being pregnant. Not only that but if a mother had prior bad experience of miscarriage then it can be a hidden fear factor in the process of pregnancy. In this context doctor-pregnant mother relationship matters significantly. The change in shape and contours of the body of a woman in itself is a change in the self-image especially during last 2-3 months of pregnancy. Bourne (1976), points out to various kinds of stresses in the pregnant mother arising due to vomiting, constipation, bleeding, taste changes in mouth, changes on appetite and food habits. Though these may be transitory in nature but they are disturbing for the female and are potential stress factors.

SOCIAL ASPECTS

social aspects are mainly with regard to the interaction dimensions involving relatives, friends, and other acquaintances. Once a woman is pregnant then after 4-5 months of pregnancy she can not hide it. Pregnant mother has a social compulsion to speak out about pregnancy and share the news at least with few people in her inner social circle. Would-be mothers often confess about this to her husband, boy-friend, mother-in-law, mother and few other friends. In many instances pregnant mothers are under great stress in disclosing their pregnant status specifically when the child in womb is out of wedlock or disowned by the father. Similarly if the child in mother's womb is due rape, war victim, or socially unwanted circumstances then such pregnancies bring mixed feelings of shame, disgust, sorrow and depression. The joy of being pregnant under above circumstances is devoid of the spirit and internal happiness which in general a woman may enjoy as bliss. Another dimension which in some cases can be a source of stress is regarding the financial expenses required for hospitalisation etc. In some countries working pregnant mothers may face loss of job and maternity leave problems, causing occupation related stress. In poor families and in poor countries pregnancy requires money which the poor mother/family may not be in a position to pay. It may be a loan or some other stressful financial arrangement that remains a tension for the mother, while child is still in the womb.

PSYCHOLOGICAL ASPECTS

Physical and physiological changes associated with pregnancy are major stressors. Pregnancy results in a major change in the mother because she is to becomes the producer of a child. The process of expected perpetuation of the child from the womb remains a phenomenon of curiousity till it happens. In fact these factors vary in one major dimension that whether it is first or subsequent pregnancy. The lesser the nth pregnancy, the greater is the amount of experienced stress. Many personal variables are likely to affect the mother like her educational level, family background, assurance and support by husband/boy-friend and parents. Some pregnant mothers get adequate information from their friends, mothers, spouses or even books or educational materials that usually diminishes their stress levels. In fact readiness to produce a child can combat the stress level and even the process of child birth can become tension free.

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The role of medical supervision during the pregnancy and at the time of child birth is not to be under estimated. The doctor-pregnant mother relationship in these instances is quite important. The doctor has not to be merely obstetrician but an assuring and trusting psychologist as well. This trusting interaction in a big way can reduce the much anticipated anxiety of the mother.

DELIVERING THE CHILD

This stage is definitely a physiological unique experience in which the quantum of pain and labour has to be born by the mother for which woman organism is built by the Nature in a definite way to cope up that much amount of biological pain. The anatomical and physiological change that a woman undergoes is natural built in mechanism. The developments in medical science and surgery have reduced the fear and mortality rate. But the vital factor is that to what extend one is able to get the blessings of these new bio-medical innovations, which is linked to the prosperity and the economic factors of the individual and her social security system. I consider that this stress factor is basically a determinant of social and economical background of the mother rather than anything else. Even in primitive societies where advancements of technology are not available the pregnant mothers in that system deliver the child without much constrains. In fact the observation of the author is that woman in such backgrounds deliver the child without much hue and cry as compared to mothers in more affluent and technologically enriched societies.

Some problems are associated with the process of labour. It is of course a natural physiological process but some mothers overestimate the fear and have a panic like feeling. That can disturb them to great extend. Similarly Caesarean operation can induce the fear usually associated with surgery. In some instances, mothers may have the knowledge about twins or more babies in the womb and that may induce fears. Women having Rh negative blood group may experience more than normal anxiety due to fear of blood mixing of mother and child. Vicarious fears can also haunt the perspective mothers if they happen to hear the news of some bad delivery, or some abnormal and painful delivery cases in the hospital or in their social circles. News like the death of a child in womb or mother during pregnancy brings vicarious fears and stress to would be mother.

The delivery of the first child is especially a major turning event in the life of the woman. In the cultural context it would be viewed with different connotations. For example in India woman is considered to pass through three stages in her life as daughter, wife and mother. Marriage converts a daughter into a wife and subsequently the birth of child converts the wife into mother. Though a woman may be concurrently a daughter, wife and mother but then her identity in the social set up is accordingly. Child birth in Indian society is very much looked forward in the context of the sex of the child-in-waiting to be born.

POST-PARTUM SCENARIO

Once the child is delivered from the womb of mother a new phase begins in the life of the mother. In terms of social psychology it is the beginning of dyadic interaction. Mother-child is one of the most intense relation in terms of physiological, psychological, social and all most all other dimensions in the life of both of them. It is quite intense in the beginning and even over long periods of time it may never diminish to lower levels. Here we shall confine ourselves to initial periods, say one year. Our interest is to focus on the stress that the mother may experience once the child is delivered. As a matter of fact it can be studied from the perspective of both of them, but we presume on the basis of conventional findings that the mother would do no harm to the child.

In the mother-child interaction the assumption, that mother may be anti to her offspring occurs not so frequently. However even if it occurs then it is due to various other social, economical, political, sibling rivalry and other factors. In fact at the root level psychological bond operates very effectively throughout their life. So we shall mainly explore the factors leading to stress in the mother regarding the child in the first year of the their interaction. Yes, there are instances in which mothers are harsh to their child, even to the extend of abandoning them and in very rare and pathological cases killing the child. These ultra kinds of acts on the part of mother are not due to lack of maternal love but because of social pressures, like illegitimate child, or child as a result of rape etc.

The common stresses that the mothers may face with regard to new born baby may be as follows:

The new born baby is too delicate to handle and it is the prime worry of the mother that her child should nourish properly. Mothers quite often become disturbed about the health status of the child. In fact mother perceives more than proportion even the minor health problems of her child. Actually a child may only cry to express his/her problem but the mother may cognize that stimulus in much greater magnitude. It is a disturbing factor for the mother to see her child sick or in any kind of suffering or distress.

The mothers are also concerned about various other aspects of the child for example how does the child looks like? Or in some instances the doctor may tell about some kind of disease or potential likelihood of some future disease in the child. These kinds of information can be anxiety provoking and disturb the newly become mother. Any kind of handicap in the child would also be disturbing and a mother would require some time before she may be able to cope with the harsh reality. If the child has some physical defect then it is an obvious stress for the mother to cope with. Mothers have various spoken and unspoken feelings and thought about the child which, after the child's birth takes a shape of facts, many of which may be hard to accept as reality. Motherhood becomes a fact after post-partum stage. Thereafter, it is to be viewed in the reality of life context which is not always pleasing. The mother has to

undergo a transition from what she anticipated before, during and after the birth of the child.

Cultural factors play very significant role in post birth scenario. According to Kakar (1981), " Birth of female child in India brings low self esteem, depression and depreciation to the mother. Celebrations are also much less; she tends to perceive a son as a kind of saviour and to nurture him with gratitude and even reverence as well as with affection and care."

CONCLUSION

The motherhood is quite an enriching experience and more so when it is the first child. No doubt that there are numerous stress and anxiety arousing factors but largely most of the perspective mothers cross this stage effectively. The mother has an added responsibility and a new learning experience but like any other new experience, process of mothering is very much emotional and biological in nature. Nine months of pregnancy in the life of a woman are remarkably memorable and have intense feelings and emotions associated with that. Women often remember these stages distinctly in their memories even after many years. Culture remains a silent but a potent factor in the whole process of conceiving, producing and nurturing the child.

I close this paper with a poem by Erica Jung, entitled, " The protection we bear." The poem appears in Judish S. Musick's book, " Young, poor and pregnant."

My baby
flowed around me
protecting me
in her own radiance
for nine whole months,
I did not fear death.
My baby within
and the spirit without
were one,
I was at peace.
Then she was born,
and fear reclaimed me.

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CONSTRUCTIONAL PROCESSES IN THE SOCIAL INTERACTIONAL ACTIVITY IN THE PEER GROUPS OF JAPANESE NURSERY SCHOOL CHILDREN: AN INTERIM REPORT

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Abstract

From the standpoint of social constructionism, the processes of the peer interaction in the group play activities were observed during three years longitudinally. The video-taped data for this study were collected in a microgenetic approach of peer plays, i. e., social pretend play, associative play, and cooperative play etc., in a natural setting in a Japanese nursery school.

This study contained the microsociolinguistic analyses of 300 video-taped peer interactive episodes by children of 3 to 5 year old age groups.

The main purposes of this study were as follows.

1. To clarify the interactive nature of the peer play of Japanese nursery school children.
2. To find out the relationship between the processes of the peer interactive activities during the peer play and the constructional processes of the peer groups.

Two older age groups (4 and 5 years old) were able to successfully enter into one of the ongoing peer play episode. They could also negotiate the playing activity or share the script (theme of the peer play) with each other in their role play. Therefore, the sequences of their play episode were longer than that of the younger one. Through microsociolinguistic analyses, the following findings were obtained. Two older age groups have used a wide variety of access strategies, i. e., entry strategies to accessing to an ongoing play episodes, and also used effective strategies for sharing and maintaining the role play activities or the script in the episode. The youngest age group (3 years old) children could not use the above effective strategies.

From the longitudinal data, it was found that the interrelationship among the peer members of the two older age groups, especially 5 years old age group, were more sophisticated and highly organized, and therefore, the structural nature of their age groups were medium of their social interactive activities in the peer plays.

Key Words: social interaction, peer play, preschool children.

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INTRODUCTION

One of the earliest psychological statements implicating peers in normal social development emanated from Piaget's early work concerning communicative development and the growth of moral judgemental skills. In his writings, Piaget noted that it is the cooperation and mutuality engendered in peer relationships that allow children to gain broader cognitive perspectives about their own social world (1965). However, the issues of the peer relation and social interaction did not occupy a central position in Piaget's later work.

The constructivist approach, which is best represented in Piaget's cognitive development theory, stresses the children's active role, arguing that children interpret, organize and use information from the environment and, in the process, construct mature skills and knowledge. Corsaro pointed out that " although the general acceptance of constructivism clearly moved theory and research in the right direction, it still clings to the doctorine of individualism (1992)."

From the standpoint of the Piagetian social interactionism, Perret-Clermon et al. (1991) also claimed that the " unit of analysis " must be focused not on the individual and his other specific behaviors but on the social interaction itself. Nowadays, the developmental psychology is beginning to try to abondom the individualism and organicism of previous theorizing.

On the other hand, the extensive literatures on children's play have reflected a major concern with the individual child's social skill and the function of play in the child's individual cognitive, psychosocial development(Asher & Coie, 1990). If social play is to be fully understood as constructed by children together, children must be studied not first as individual but as a group of individuals collectively establishing and communicating meaning together as they play.

It is necessary to shift to an account of human development not as an individual's construction of social skills or cognitive structure, but as a collective social production through participation in social contexts, i. e., children's social interaction, the structure of the peer relationships (friendships) among children (Kindermann, 1995 ; Meckley, 1995), and some environmental factors (Montagner et al., 1988).

AIMS OF THE PRESENT STUDY

It is the purpose of this study to describe the structure of spontaneous episodes of social play in the natural settings of a Japansese day-nursery school, and to suggest the influences of interpersonal relationships among peers which underlie the processes of their peer interactions and social play activities.

1. In order to analize the organization of social plays of 3 age groups from 3 to 5 years old, we examined the processes of social interactions in children's spontaneous play activities. We ask the question : How the peer interactions are carried out in the children's spontaneous social play ?
2. It also examined the interactive nature of peer plays at each age groups and compared the interactive activities among 3 age groups. We ask : How do interactional activities change from age 3 to age 5 ?
3. To find out the relationship between the processes of the peer interactive activ-

ities with the structure of the interpersonal relationship (friendship) or peer contacts in group settings, we observed the nature of children's behavioral orientations and peer contacts in group settings longitudinally. Our goal was to chart the children's behavioral orientations and patterns of peer contact within a particular social setting that characterized the children's interactions in peer group play. We examined the degree to which individual differences in children's behavior orientation and peer contact patterns remained stable over time through the longitudinal observation.

METHOD

Subjects

Subjects of Cohort 1 were about twenty five children from 3 age groups starting at age 3 at a day nursery school in a large city of Japan (Table 1). Subjects of Cohort 1 were observed continually for one year period. The majority of children came from middle-class families.

Children of 4 and 3 years old who were participated in the first year of the project as subjects of Cohort 1 were followed subsequently for one and two years later respectively. Subjects of the observation at 1994 were named Cohort 2 and subjects at 1995 were named Cohort 3 (Fig. 1).

Data Collection Procedures

Two observers video-taped children's social play during their regular day care hours in each age group's classroom and at play ground of the nursery school.

We observed peer interactive episodes of their group play once or twice per week for each age-group.

Observations were made of peer interaction (a round of at least two behaviors

Table 1 Number of Subjects

	3-years old	4-years old	5-years old
N	25	25	26

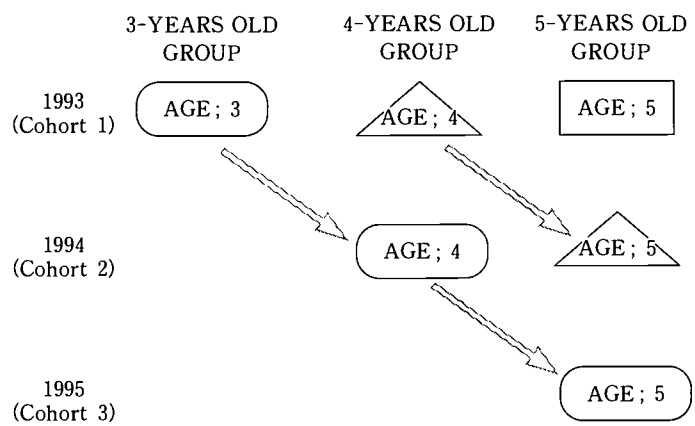

Figure 1. Schedule of Observation

by at least two children relating to the same object, activity or subject) and of the person with whom the interaction occurred.

We observed peer routines and peer interactions based on the principle of the participatory observation, and recorded the interactive episodes in the field notes as well as video recording.

In accordance with Corsaro's definition (1985), interactive episodes are defined as those sequences of behavior which begin with acknowledged presence of two or more interactants in an ecological area and the overt attempt(s) to arrive at a shared meaning of ongoing or emerging activity. Episodes end with physical movement of interactants from the area which results in the termination of the originally initiated activity.

During three years observation periods, about 300 interactive episodes, all video-recorded, were gathered.

Transcripts containing the children's actions, utterances, and the objects used in their play were prepared from the video-tapes by two assistants, and the further analysis of the social interaction were carried out.

RESULTS and DISCUSSION

In 1993 we observed the peer plays of each age group as Cohort 1 subjects during one year longitudinally in a naturalistic settings, and derived 164 interactive episodes of peer plays. The data of interactive episode were obtained for some interactional analyses.

1. Developmental change of the collaborative play

To describe the extent that children enact play together documenting the continuous flow of collective and interactive play within and between players and play groups, we classified the children's social play under four categories according to the following two criteria.

interconnectedness: The play events of children were not only consistent in sequence of actions and within time but also show an evolution and interconnectedness with one another.

shared knowledge: Participants in the group play shared the world of their playing make-believe reality and their role and rule each other in their collective play.

Interrater reliability for the classification between two coders was .72.

Type 1: not-sharing the rule and role/lack of collaborative play, i.e. parallel play

Type 2: partly sharing the rule and role/partly collaborative play

Type 3: fully sharing the rule and role/partly collaborative play

Type 4: fully sharing the rule and role/fully collaborative play

Table 2 and Figure 2 show the number of play episodes of each age group at 4 categories. These data generate the following results: From 3 to 4 and 5 years of age, the frequency of parallel play decreased and group play increased. The frequencies of unoccupied and onlooker behaviors decreased, whereas conversations with peers and group-constructive play increased.

It was cleared that the number of Type 4 play increased but the number of Type 3 play decreased at the stage of the last half of 3 years age period comparing with at the stage of the first 6 months of 3 years age from a one year longitudinal observation data (Fig. 3). That is, during the last half of 3 years, children showed tendency

Table 2 Number of Play Episodes at Each of the 4 Categories

	TYPE 1	TYPE 2	TYPE 3	TYPE 4
3-years old	4	13	24	22
4-years old	1	9	9	32
5-years old	0	7	6	37

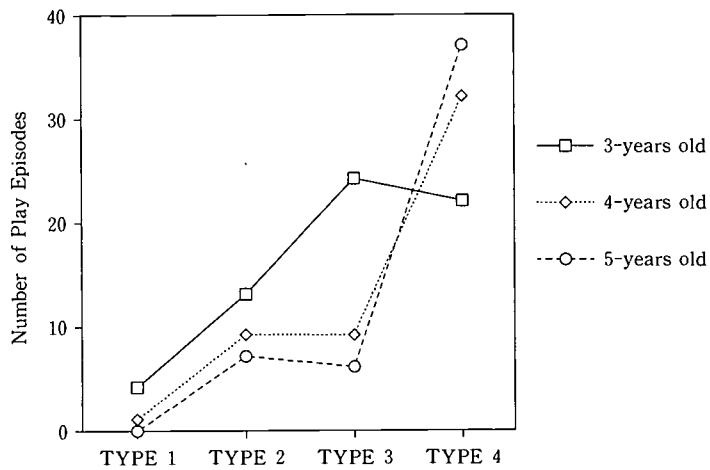

Figure 2. Number of Play Episodes at Each of the 4 Categories

toward shifting to group-construction play.

2. Pattern and structure of peer interaction

(1) Developmental change of interactive behavior in group play

Table 3 and Figure 4 show the degree of verbal and nonverbal behaviors in attempting to maintain control over the communally constructed and shared play activities. Children's interactive activities falled into eight categories.

"A"categories were strategies used at the starting and entry-into the group play.

A1: invite other child (ren) for gathering and attending the ongoing group play

A2: ask about ongoing plans and scenarios of fantasy or peer play

A3: propose or explain about the plans and scenarios of fantasy or peer play to other participant(s)

A4: accept the plan and scenarios of fantasy play which other participant(s) proposed

"*B*" categories were maintaining and negotiating strategies for the collaborative play which were used during the ongoing peer play

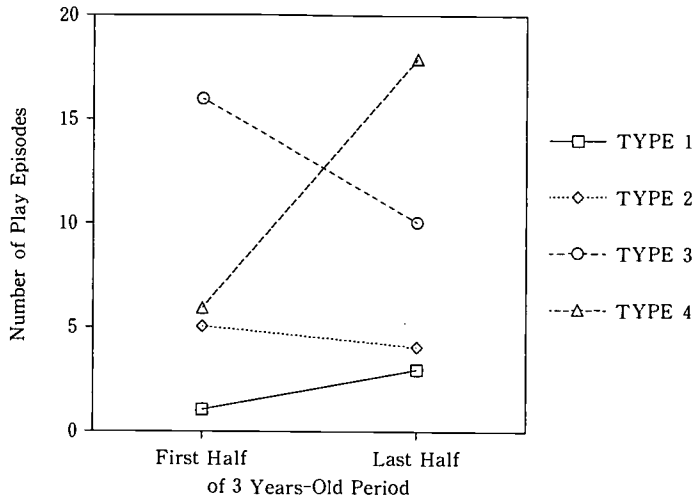

Figure 3. Number of Play Episodes at Each of the 4 Categories (3 years old)

Table 3 Frequency of Interactive Activities at Each of the 8 Categories

(%)

	A1	A2	A3	A4	B1	B2	C	D
AGE: 3	1.7	3.1	22.6	6.3	40.5	10.1	3.6	11.9
AGE: 4	0.6	3.5	25.2	1.7	12.7	11.2	4.3	10.8
AGE: 5	1.1	2.8	28.1	4.3	43.2	6.4	4.6	9.6

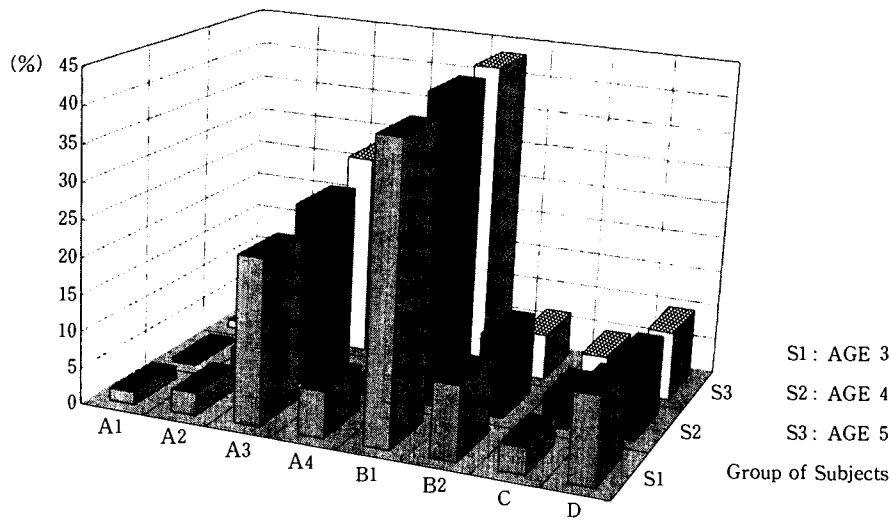

Figure 4. Frequency of Interactive Activities at Each of the 8 Categories

"*B1*": strategies for maintaining their shared play activities

"*B2*": joint other play activity with ongoing play

"*C*": discord the plans and scenarios of ongoing play with other participant(s)

"*D*": not shared play activities

Total numbers of eight categories derived from the observation at each three age groups were 1,273, 1,388, and 1,272 respectively.

Two older groups were used to apply strategies such as A3 and B1 category more than the youngest one, and those results suggested that 4 and 5 years old children utilized the effective strategies to sustain and continue the collaborative play. Behaviors of category A3 are necessary to share the rule and role in the group play with each other , and strategies of B2 are also essential strategies and techniques for maintaining and negotiating the contents of their play involving plans , actions and objects.

(2) Sequential analysis of interactive activities in peer plays

Figure 5-1, 5-2, and 5-3 show the results of the sequential analysis of the eight categorical behavior of each age-group. These results suggested that the commonly and frequently occurred patttern through three age-groups were the direction of from A3 to B1, that is, after children proposed about the plan or scenario of the play activity (A3), they played and adopted a technique for maintaining the scenarios of the peer play which was proposed by the participants.

When the other play activity occurred with ongoing play episode (B2), children of two older age-groups often used the procedures of reestablishing the continuum of within-frame episode and negotiating the content of their main play theme (B2→A3). The youngest one did not appeared to adopt such strategy.

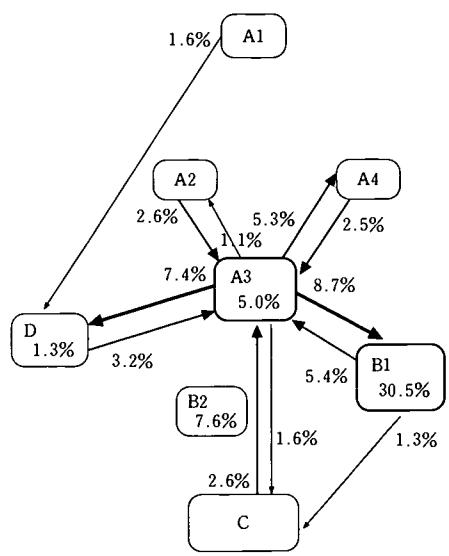

Figure 5-1. Sequential Pattern of Interactive Behaviors (3 years old)

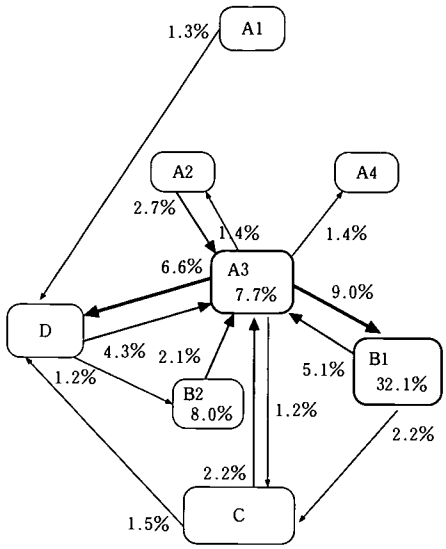

Figure 5-2. Sequential Pattern of Interactive Behaviors (4 years old)

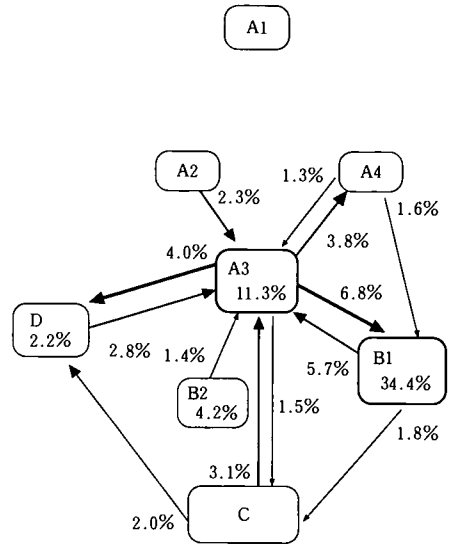

Figure 5-3. Sequential Pattern of Interactive Behaviors (5 years old)

In comparison with two older age groups, children of the youngest group (3 years old) more frequently inclined to shift from A3 to D, i.e., they were easily tend to differ the play scenarios or plans with each other and destroy the collaborative play ongoing play episodes. It might be one of the reasons for the lack of the shared play activities at the youngest group.

(3) Typical processes of peer inteactions at each three age groups

1) Case No.009 Constructive play *Making an animal park with woody blocks* (5 years old)

They utilized a system of rules and procedures to sustain and continue collaborative play with implicit pretend rule at times.

At the stage of proposing the plan and scenario, J and R did not show their plan of peer play verbally, but they shared knowledge and procedures of playing activities properly by making reference to their ongoing activities with each other. It seemed that they could infer about the plan or script of play which was intended by the other participant from attending to the other participant's ongoing behavior , since they have shared many experiences of collaborative play with each others for a long time (2 or 3 years).

〈Transcription〉	〈Interpretation〉
proposing plan & scenario	
J starts to make a circle with wood blocks with no verbal interaction, and then he gathers blocks of animals.	→J : monological activity
playing within-frame	
R begins to make a round circle with J with no verbal reaction.	→R : monological activity It seems that R understands the plan of the play (making an animal park) which J intended.
J & R arrange blocks of animals within the circle	
J : This is a place where animal eat, OK ?	→J & R : dialogical activity
R : Yes, food is in this box.	J & R effectively share the plan and scenario with each other, and group-constructive play progress well.
J : This is a special kind of food.	
R : This food is indispensable to their life.	

2) Case No. 084 Fantasy group play *Travel to the outer space* (4 years old)

M and K participated a fantasy play with a magnetic board.

M and K shared an outline of the play theme which they traveled to the fictitious cosmos with a flying disc in a made-up story , but they did not share the concrete plans and scripts of their fantasy play. So, in order to maintain and negotiate their shared play activities, they confirmed the content of each scenarios and actions of their peer play which were propsed by the participants each other at the individual stage of the interactive processes.

〈Transcription〉	〈Interpretation〉
proposing plan & scenario	
K : We can travel to any stars by this flying disc (pretending that the hexagonal magnetic button is a flying disc). Which do you like to visit the star of yellow, red or blue ?	→K & M : dialogical activity K proposes a fantasy play and M accepted her proposal
Playing within-frames	
M : To the star of blue !	→K & M : dialogical activity
K : I can't understand where the star of blue is. So, please tell me another one.	K & M play within same frame.
M : Well, the red one !	
K : The red star is filled with sweet candies. Let's travel to the red star.	
proposing another plan	
K : (Picking up the magnetic of another animal toy) I'd like to travel with your animal.	K proposes the expanded play activity
playing within-frame	K & M enact the shared play
M : (Picking up a toy giraff) I'd also like to travel.	
K : I'm afraid this disc won't take two animals.	
M : Well, (talking to the giraffe) please look after the house in our absence.	

3) Case No.064 Family role play (3 years old)

T and I continued to play within-frame in a short while, however, the shared

play activities were interrupted in the middle of their role playing. These failures were caused mainly by T missing his cue as the husband in the family role play. They could not persist in seeking to maintain control over their shared play activities.

〈Transcription〉	〈Interpretation〉
Playing within frame	
(T ; husband, I ; wife)	
T : Good night.	→T & I : dialogical activity
I : Good night.	They played in a family role playing
T : Are you sleepy ?	properly.
I : Yes, I'm.	
T : Here is a glass of water.	
I : Thank you. (She drinks it.)	
(T went out to take another glass of water.)	
T : I put it on the floor.	
I do not drink it and begin to sleep in.	
T again went out suddenly.	→T suddenly enacts the behavior out of
Playing within frame	context, and at this time the shared play
T & I are in the kitchen room and then telephon rings	was interrupted.
I : My darling, you are wanted on the phone.	
T : What ?	
I : You (T) must act the role of a husband.	
T : I don't understand what you are saying.	→T forgets his role as husband in the
I : There's a telephon call for you (husband).	family role play.

3. Change and stability of the structure of interpersonal relationship

To describe the structure of interpersonal relationships among peers, we analyzed children's reactions towards the others and the persons with whom they interact during group play sessions from video-recording data.

One objective of this analysis was to determine whether there were temporal changes in children's contact patterns and interactional contexts over many years.

We also examined the relationships between the patterns of the interpersonal contacts and the interactional activities in the group play.

Interactive episodes of 3 to 5 years old boys were only focused for analyzing data.

Figure 6-1 shows the structure of the interpersonal relationships among 5 years old boys who were participated as 5 years old subjects at 1993. Play leader : J and sub-leader : S organized the collaborative play activities. For example, they often controlled the block play events by which they invited M to participate to their peer play as the co-worker, since he was good at constructing the block in spite of his low status in the peer group.

The structure of the interpersonal relationship of their peer group was highly inter-connected and organized, and such social relational roles (status and grouping) were consistent during one year observation period. As leaders, J and S often appeared to create situations and new games. The group members learned the cultural rules of status and managed to control this particular play community.

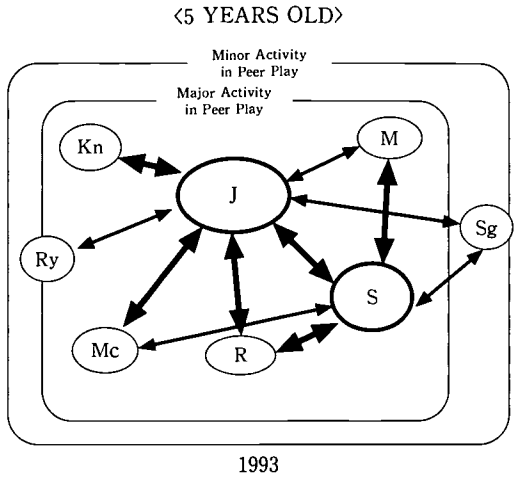

Figure 6-1. Structure of Relationship among Peers (5 years old at 1993)

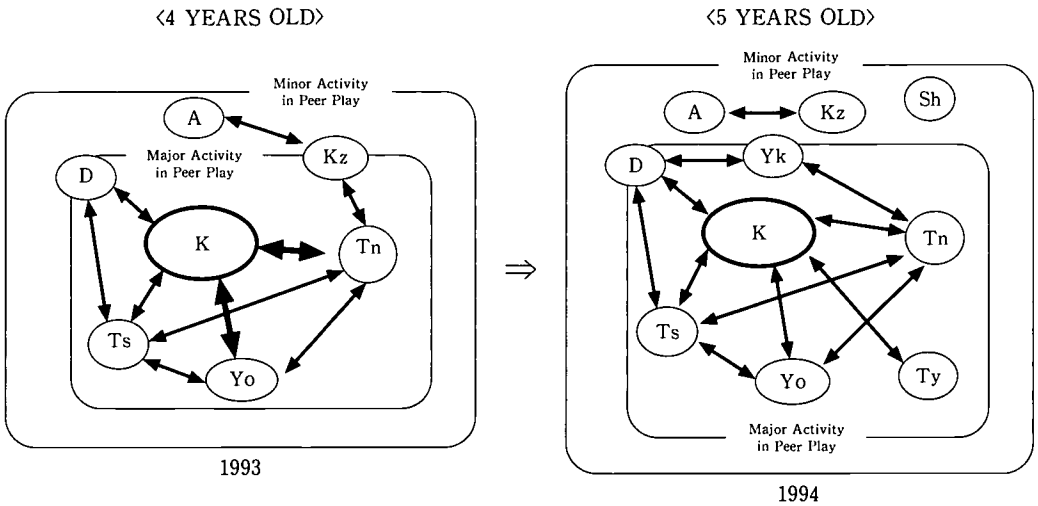

Figure 6-2. Structures of Relationship among Peers (4 years old at 1993 and 1994)

Figure 7 shows the number of play episode of 3 age groups when they were 5 years old. Five years old age group showed in fact the high percentage of Type 4 play more than other two age groups. Their peer plays were constructed with more shared play rules and with collaborative manner.

It was considered that such highly organized structure of peer group characterized children's effective interactive activities in their collaborative play.

Two schematic figures of 1993 and 1994 (Fig. 6-2) are the structures of relationship among peers who were subjects as 4 years old at the initiation of this project. Data of 1994 is the result of children when they were in the 5 years old age group.

K was a boss in this peer group, and he often controlled the group play. However, he could not so effectively organized the peer group because of some failure in his

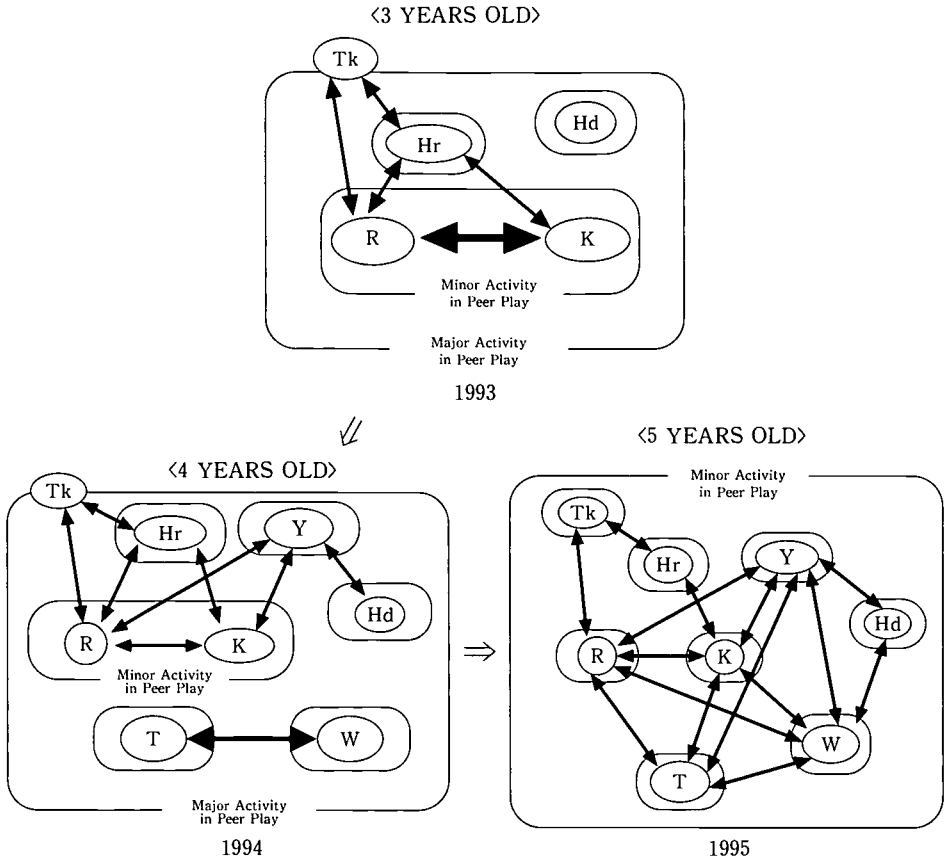

Figure 6-3. Structure of Relationship among Peers (3 years old at 1993 to 1995)

leadership and the absence of a sub-leader who would assist him as his co-worker. The proposal and instructions from K for the group play activity were not shared with other peer members frequently, and from this reason their ineffective constructive interaction were existed in their group play more than the interactive activities of 5 years male group at 1993 (Fig. 6-1). The connectiveness of this peer group became loose, and the structure of group was also diffused at 1994 (Fig. 7). The basic characteristics of the structure of their peer relationship was relatively constant during the two years peirods from 1993 to 1994.

Figure 6-3 shows the result of the structure of peer group which was 3 years old subject at initiating the project during three years from 1993 to 1995. In 1993 the shared activities between R and K were occurred in their peer play, and other members also often participated with this collaborative play, for example, block construction play. Their peer group, however, was not highly organized and connected by R and K. As 4 years old group at 1994, their peer activities were also going on by R and K, however, the interactive activities among peers were not closely linked each other as the same results of 1993. The tendency of the structure of peer relationship in this male group was continued at 1995. Highly constructed collaborative group play was

no
ac
ship.

It was resulted that the difference and uniqueness of the structure of peer relationship among three 5 years male group was existed through comparing with from Figure 6-1 to Figure 6-3.

CONCLUDING REMARKS

In this study, we aimed at the following points.

1. To describe the nature of the social interactive activity and to clarify the age changes of these social interactive behaviors during the group play activities of the nursery school children from 3 to 5 years old.
2. To find out the corelations or interrelationships between the peer interactive activities and the structures of the friendship, so called the social networks among peers.

For the first objective, we discussed the developmental change of the collaborative play among three age groups by observing the peer interactive episodes of their group play and classifying the children's social play under four categories. We obtained the developmental change among three age groups, that is, 4 and 5 years old children utilized the effective procedures to sustain and continue the collaborative play. It was cleared that two older age groups have used wide variety of effective strategies for maintaining and sharing the role play activities and the script in the episode.

We described the peer group profiles or the social networks of each three age groups and examined the relationships between the structure of children's peer relationships and patterns of the interactional activities in their group play for discussing the above second problem. The social network of five years old age group was highly organized and more interconnected with each other, and such highly organized structure seemed to sustain children's effective peer play. On the contrary, the structures of the

interpersonal relationships of two younger age groups were not so highly organized as compared with the oldest one, and for such reason effective co-constructive or collaborative interaction did not occurred in those groups.

It suggests that the structure of peer play group characterizes the children's interactive activities in their peer play.

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DEVELOPMENT OF SELF-REGULATION THROUGH DIALOGUE : SELF-ASSERTION THROUGH SELF-INHIBITION

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As Kopp and her colleagues have suggested (Kopp, 1982., Vaughn, Kopp, & Krawkow, 1984), research on development of self-regulation in children seems to have been focusing on the process by which they acquire the ability to inhibit their own behavior according to situational demands. In Japan, however, self-inhibition in children has been found to be excessive as a result of cultural constraints (Kashiwagi, 1988). In addition, it seems to be important, but difficult, for Japanese children to become able to assert themselves effectively.

In fact, it is rarely acceptable in '*soto* (out-circle; e.g., public interaction)' to use simple assertive strategies, such as 'positive politeness (Brown & Levinson, 1987)', which likely allows one to express his or her demands rather straightforwardly. This is because the Japanese culture has a feature distinguishing '*uchi* (in-circle; e.g., family)' from '*soto*'. And in addition, children are allowed in *uchi* to be willful to some extent, but they are expected to be 'a good child' in '*soto*'. So, self-inhibition is considered as a polite way of negotiating with others. In other words, the maintaining of 'WA (harmony among people in a Japanese way)' are so valued in Japan that the 'negative politeness (Brown & Levinson, ibid.)', such as the expression of '*hairyo* (considerateness)' for avoiding causing the hearer to lose face, is considered a more effective/careful assertive strategy. The typical example of '*hairyo*' behavior can be seen in the conversation between the 'invitor (the person who invites)' and the 'invitee (the person who is invited)'. When the invitor senses ('SASSHI'; reading the intention of others) the negative reaction/attitude of the invitee, such as silence or whatever, even though it is not so clear because of being 'off-record (the avoidance of unequivocal impositions)' (Brown & Levinson, ibid.), the invitor inhibits himself or herself by making excuses for the invitee, so that the invitee can decline the offer relatively easily (Szatrowski, 1993).

We must be careful, however, if we feel that the invitor only takes into consideration the intention of the invitee one-sidedly in the conversation above. That is not always true. By making excuses 'for the invitee', the invitor also wishes the invitee to sense what invitor really means. That is, the invitor asserts himself or herself by means of 'off-record', so that the invitee accepts the offer. This can be defined as the

strategy of 'self-assertion through self-inhibition'. As mentioned above, in Japan, reading the mutual intention (reading between the lines) is taken as so important that 'self-assertion through self-inhibition' is much more likely accepted than any kind of 'direct self-assertion'.

As in many Asian countries, a clear switching of speech-style ('style-switching') between a formal or careful and an informal or uninhibited/relaxed style is used in Japan to express the attitude of a speaker to a hearer. Even though, in certain cases, the style does not correspond with the real attitude of the speaker, along with this switching, the 'self-assertion through self-inhibition' is carried on to regulate the relationship between the participants in the conversation.

Without taking this kind of cultural feature into account, investigating the development of self-regulation cannot clarify its process and mechanism thoroughly. That is because social relationships or social interactions have a great effect on development. The Vygotskian view claiming that the utterances of individuals are regulated by dialogue in social interactions (this has been referred to as "dialogicality" by Wertsch (1991)), therefore, provides the framework for that clarification.

Thus, this study aimed to clarify the development and the social formational process of self-regulation in children, characterized as 'self-assertion through self-inhibition', through dialogicality.

Method

Subject

Eighteen-month-old boy ("Nori"), 4 year-old girl ("Miho"), and 9 year-old girl ("Miki") served as subjects. They all live in the suburbs in Tokyo and are the children of nuclear families. Nori has parents and a 6-year-old brother. Miho lives with her parents, her 9-year-old sister, and her 6-year-old brother. Miki's family consists of her parents, her 13-year-old brother, and her 8- and 5-year-old sisters.

Procedure

According to the procedure taken by Barker and Wright (1951), all the interactive activities between each child and other persons during a certain week day, from when they got up till when they went to bed, were recorded with audio-tape-recorder and video-tape-recorder by two observers who also took notes. A few days after the observation, the observers again visited each child and their families to get information necessary for the analysis, such as who a certain person who interacted with the target child is.

Then, all their interactive activities were transcribed. According to the aim of this study, all activities related to the development of self-regulation were compared among the three different aged children seeking commonal features and differences.

Results and Discussion

The characteristic commonal features and differences among the three children were observed as follows.

Eighteen-month-old boy

The 18-month-old boy, when his demands were refused or ignored by his mother for some reasons, did not keep on demanding and started to do something else (Script 1). When his mother told him to stop what he had been doing, he looked at his mother's face and tried to read her intention, then, decided to quit or not (Script 2, 3). That is, he chose either self-assertion or self-inhibition alternatively by 'social referencing (Source, Emde, Campos, & Klinnert, 1985)' to the facial expressions or the prosodic features of utterances of his mother. To restraint, he did not react simply with a compliance or a defiance, but through 'direct interaction' with his partner, he read her demands and controlled his own behavior. What 'direct interaction' means here is that the interaction proceeds without any 'mediational tools' like language. This corresponds to those situations where the socialization of the child was carried through close interactions with his mother (e. g., cooperative care-giving by sharing the roles; 'joint activity').

Script 1

18-month-old boy; Self-assertion and Self-inhibition
〈Sweets time〉

Nori : Ton-ohn*1 (patting mother on the shoulder)
Mother: Yah
Nori : (rushing for the kitchen)
Mother: Oh, already gone!? You had too much! Nori, there's no more.
Nori : Wwaaan!*2 (back from the kitchen and raise his hand)
Mother: No more left. (will not move)
Nori : (come close to mother) Noh! (*tugging out tissues*)
Mother: (funnily looking at Nori's face) No more left.
Nori : (*tearing out tissue*) Tattaaaa*3 (*leave the room*)
*1 incomplete onomatopoeia of patting on the shoulder
*2 complaining
*3 jargon

Script 2

18-month-old boy; Social Referencing
〈Mother's directive in child's dangerous situation〉

Nori : (stand on the table)
Mother: Nori, get off. Dangerous. Nori, get off, get off (these two 'get off'-s are in baby talk)
Nori : (*looking at mother's face, then crouch down trying to get off*)
Mother: (after a while, come up to Nori, and hold him in her arms to let him get off)

Script 3

18-month-old boy; Social Referencing
〈Mother's negative estimation to Nori's playing with a cable〉

Nori : (drop something by tugging the cable)
Mother: Ugh, ugh, ugh, ugh, ugh, Nori. (back to newspaper) Noh-ri.
Nori : (*take a look at mother's face*)
Mother: (shake head with making up a lower lip)
Nori : (*gaze at mother's face*)
Mother: No, no.
Nori : (let go the cable and make up a lip lying on the floor on his back)
Mother: No, no. Ok? That doesn't work. Mom don't care.
Nori : (kicking the floor, rubbing the eye. still making up a lip, kicking the floor with both legs, and shaking his body)
Mother: (start to laugh)
Nori : (loosen his face, wry smile)
Mother: What a boy...(looking at the flier) Today....
Nori : N. (shake his body) Gyaah, aah (kicking the floor and enjoying)

Owing to limited language ability because of his age, this 18 month-old boy regulated his own behaviors by referring to the visual and prosodic features of the interaction which can be characterized as 'a dialogue not so much dependent on the meaning of the words'. The regulation, however, was an instance of 'self-assertion' or 'self-inhibition' as seen above. This seems due to the social relation where his participation is not so complicated, so it can be characterized as 'push or withdraw' rather than 'compete'. Another point of view, however, is that here, the beginning of '*sasshi*' or '*hairyo*' can be seen. Reading the intention of others ('*sasshi*') by the partner's facial expressions or prosodic features of utterances corresponds with the strategy which older children and adults make use of. In addition, however, older children and adults make good use of the meaning of the words.

Four-year-old girl

As for the 4-year-old girl, in common with the 18-month-old boy, she made use of 'the direct interaction' which was seen in 'physical contact' with others. She hugged her nurse at the nursery school (Script 4) or her mother (Script 5) as if she tried to ease herself or tension of the situation.

Script 4

4-year-old girl; Physical Contact
<at nursery school, after nap>

Nurse: Miho, come on, let's go
Miho: (come close to the nurse)
Nurse: Mipo*1, good afternoon
Miho: (*hug the nurse*)
Nurse: Goody afternoon
Miho: Today, (/s*2) I didn' make a mess
Nurse: (/s*2) Heave-ho! huh? (get down on her knees) (eye to eye)
Miho: (with a smile) (To) day, I didn' make a mess

Nurse: Right, you didn'. Let's go and change clothes.

*1 one of Miho's nicknames.
*2 (/s) signifies the synchrony of the utterances.

Script 5

4-year-old girl; Physical Contact
〈at home, talking about CD〉

(Miho sits on the sofa, Mother stands beside her)
Miho : (making up a lip) Weren' you listening to that of Drabon Ball?
('Dragon Ball'*1)
(eye to eye)
Mother: Huh?
Miho : Drabon Baaall!
Mother: (slightly laughing) What of Drabon Baaall?
Miho : (*hug the mother*)
Mother: (move a little, holding Miho in her arms)
Miho : (coming down from the mother) You know, that of grown-ups
Mother: Huh?
Miho : That of grown-ups.

*1 'Dragon Ball' is the title of the Japanese famous cartoon.

The difference between this 4-year-old girl and the 18-month-old boy seems in her growing language ability. With that, she was able to make use of the words of her mother or other adults ('ventriloquation'; Wertsch, 1991), such as the nurse of the nursery school, in a negotiating situation, even in the absence of those adults. One instance of this use of language was a use of 'indirect speech'. In the following inviting-to-play conversation with her friend, the girl used this speech form and it functioned to control or regulate her own behavior so as for her assertion to be accepted (Script 6). This form was, in fact, frequently used by her mother to control the behavior of the girl in various situations such as discipline, joint activity (e.g., doing the dishes in the kitchen), and so forth (Script 7).

Script 6

4-year-old girl; Indirect speech
〈at nursery school, playing with mud〉

(a girl comes close to Miho)
Girl : Miihoo
Miho: (turn to the girl) Plant a persimon tree (go on playing with mud crouching down, not looking at the girl) *Do you wanna plant, too?*
Girl : Don't know. ///Let me join you. (looking at another direction)
Miho: OKay. (mixing the mud) [ia]*//*Do you wanna join me?*
Girl : Yeh, OKay.
Miho: Mother crab, has gone

Girl : (come close to Miho) Sure, I take that.
Miho: OKay. Mother crab, is gone (look at the girl)

*inaudible

Script 7

4-year-old girl; Indirect speech of Mother
〈at home, in the kitchen, doing the dishes〉

(Miho stands on the chair doing dishes, Mother cooks beside her)
Mother: *Do you wanna quit, that ?* (looking at Miho)
Miho : I wanna quit? Not yet. (not looking at Mother)
Mother: You sure?
Miho : I sure.

Another instance was the use of 'formal (careful)-speech-style'. When she was arguing with her brother (6-year-old), the girl used the speech style to assert her innocence (Script 8). With the use of the style, she seemed to try to put into her utterance the 'authority (Wertsch, 1991)' of adults, such as her mother, to persuade her brother. This usage of 'formal (careful)-speech-style' can be taken as the emergence of 'style-switching'.

Script 8

4-year-old girl; Formal-speech-style
〈at home, arguing with Brother〉

Miho : Who took off this?
Mother : Huh?
Brother: You did it, you
Miho : This. Who took off?
Brother: You did it, you, yourself
Miho : *No, I did not.*

The instances above seem to indicate that she began to balance self-assertion with self-inhibition in the sense that she was able to persuade others according to the behavioral basis and strategy which she had come up with through the 'inner dialogue' with, for example, her 'absent' mother. Thus, she was able to regulate her own behavior non-alternatively. Moreover, this suggests that she was able to follow or, at least, to sense a narrow kind of social rule which is mentioned above as 'behavioral basis and strategy'.

Together with growing language ability, the expanding social relations, which means an increase in the number of people with whom the child interacts, also seems to play an important role for the emergence of the balancing of 'self-assertion'-'self-inhibition'. The more social relations expand, the more complicated it becomes to regulate one's own behavior. That is, the necessity to take in and to read the intentions of

others grows and, as a result, a simple 'self-assertion' becomes rather useless. The 'inner dialogue' with the 'absent' mother, as mentioned above, seems to serve as a facilitator for the girl to deal with this situation. In this way, she has become sensitive to the stand-point of herself and that of others, and begun to balance self-assertion with self-inhibition, which can be taken as a somewhat advanced form of '*sasshi*' and '*hairyo*'.

Though the emergence of the balancing of 'self-assertion'-'self-inhibition' was seen, the 'direct interaction' was still made use of. This can be interpreted as follows. The growing, but still imperfect, language ability occasionally led to a competing situation. Then, the 'direct interaction', such as 'hugging', was used to ease the tention of the situation. This suggests that the co-existence of the 'direct interaction' form and the 'indirect interaction' form can be seen at this point in the developmental process of 'self-regulation'. And also it can be said that she was able to regulate herself and her partners with both 'direct' and 'indirect' interactional strategies.

Nine-year-old girl

Compared with the 4-year-old girl, the 9-year-old girl asserted herself by obeying social rules and with authoritated rules and words in society. Moreover, by making use of rules and words, she created her own rules which exceeded them ('rules over rules') to assert herself. This seems due to the still growing language ability and to the still expanding social relations (home, neighborhood, school) with whom she had social interactions and an 'inner dialogue'. Faced with a variety of social rules according to the expansion of the social relations, 'how to behave' in 'which situation' had been dialogically formed through the social interactions as 'format'. Then, with reforming it through the "inner dialogue', she made use of it in practice. As an instance, when she tried to make her intention accepted by her friends, she made use of the formal (polite)-speech-style which is used in 'public situations' such as class-room discussions (Script 9, 10).

Script 9

9-year-old girl; Authoritated words
〈at class, collaborating work〉

Miki : Where? No. 3? Did she say No. 3? Wait a moment. Here it is, No. 3.
Girl : Sweat? All that will never come down.
Boy : I got it! Why it becomes dim. Sweat comes this way, then the gasses, and that evaporates, then dim...
Miki : Mr. Kami (Boy's last name), *we have already made this far*, so..
Boy : OK, ah, in this case, if we put No. 12, the half of the store will disappear.
Miki : That's the way.

Script 10

9-year-old girl; Authoritated words to control the partner
〈at class, playing with cards〉

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Miki : Hold 16 cards, back on top, *shuffle them as many times as your age.* Go ahead, shuffle them. Shuffle, shuffle. (two friends holding the cards)
Boy : Don't know how to.
Miki : You, that's not it

In another situation, when her friend asserted, on the other hand, she made use of the 'rules over rules' to assert herself (Script 11). This suggests that, though the 9-year-old girl inhibited herself by obeying the rules of the society, she already had a potential to assert herself by making use of other rules or 'rules over rules', such as by means of 'off-record'.

Script 11

9-year-old girl ; Rules over rules
〈at school, on the corridor, talking about if they play after school〉

(it is raining)
Miki : Oh, oh, dark as black !
Girl1 : Oh, pitch dark !
Girl2 : (to Girl3) Going home ?
Miki : No ! !
Girl2 : But, my bicycle..
Miki : That's ok.
Girl1 : Ho (sigh)
Miki : *Lead it*, and that'll be ok. What are you talking about ?

This phenomenon seems to correspond to the 'self-assertion through self-inhibition' feature of the socializational strategy by the parents or the school teacher which is based on social rules or using their 'authority' (of the parents or the school teacher) which the girl senses. The strategy emphasizes the 'reading the intention of others ('SASSHI')', so this can be defined as an 'indirect socialization'. The girl seems to adopt this strategy to her friends in the negotiating situation.

As mentioned above, she was able to make use of the 'self-assertion through self-inhibition', though not fully, occasionally with the speech-style-switching, to regulate her own behavior in order to control that of the others.

Conclusion

This observational study aimed to clarify the development and the social formational process and mechanism of self-regulation characterized as 'self-assertion through self-inhibition' along with the dialogicality. The findings were as follows.

At the age of 18-months, a child is already able to assert/inhibit himself or herself according to the situation of the partner. Though the regulation is 'alternative' and carried out through 'direct dialogue', along with growing language ability and with expanding social relations according to age, it becomes rather 'indirect' and the balancing of 'self-assertion' with 'self-inhibition' emerges through 'inner dialogue (making use of the words of others ;' ventriloquation')'. At this point, 'direct dia-

logue' such as the 'physical contact' can also be seen, but thereafter, the child begins to regulate himself or herself to control the partner by making use of the authoritated rules and words in society, of speech-style-switching, and of 'rules over rules' dialogically. Now, the emergence of the 'self-assertion through self-inhibition' is obvious, which can be added to the 'Phases of Control' table of Kopp (1982) because this can be defined as more advanced phase than 'Self-regulation' in the table.

Throughout the observation periods above, one more thing is obvious about the development of self-regulation or the child socialization, somewhat especially in Japan. That is, the 'off-record' strategy seems to be rather valued in interactions. And in addition, this strategy is a key to get into or to be accepted into social interactions, which means that it is a very important developmental task in order to be a member of society. It is true that this type of strategy can be seen in various cultures, but to sense the 'off-record' is socially demanded from early childhood in Japan. And as this study suggests, this strategy becomes available through dialogicality.

As seen above, self-regulation, therefore, develops consistently based on the mechanism of the dialogicality. That is, the function of the dialogicality (and 'ventriloquation') plays an important role in the process of social formation of cognition and behavior.

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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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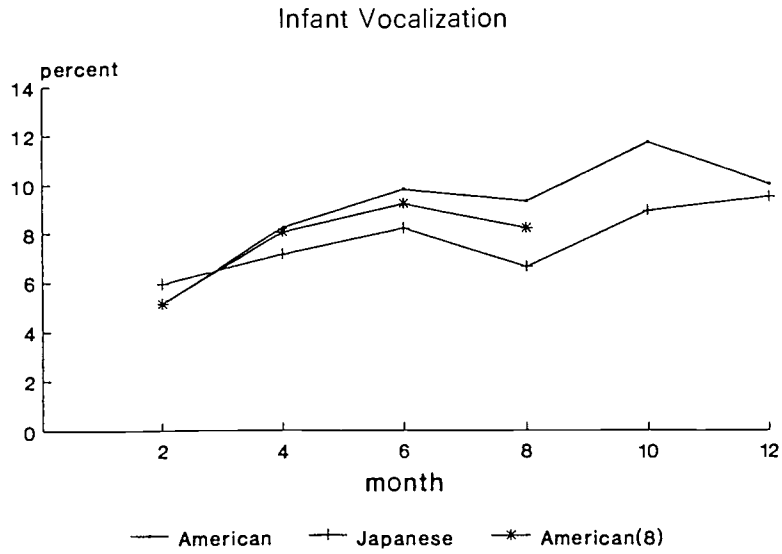

Figure 1. Comparison of infant behavior.

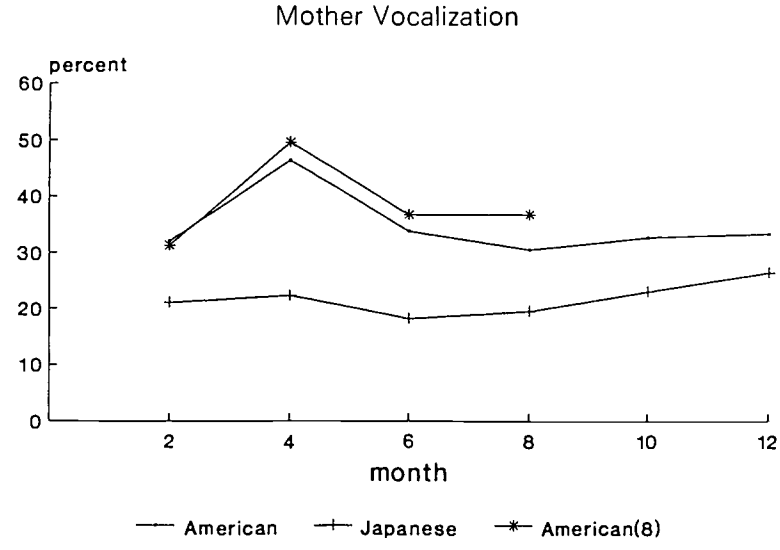

Figure 2. Comparison of maternal behavior.

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-

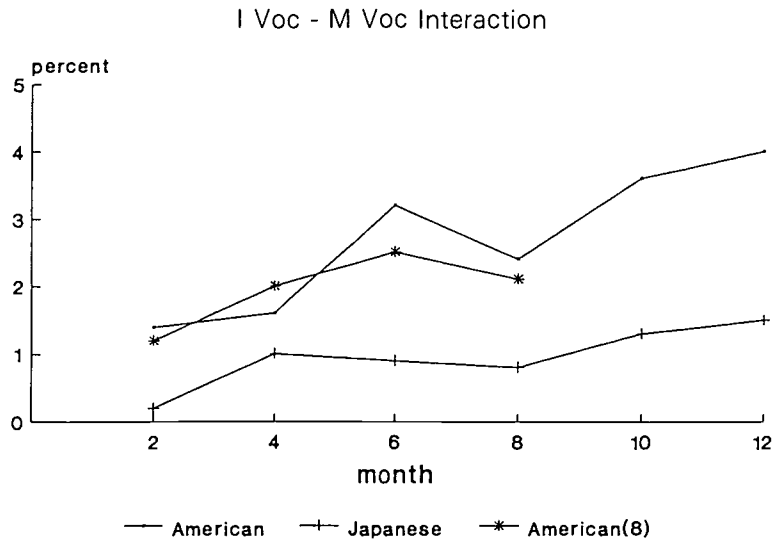

Figure 3. Comparison of interaction.

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-

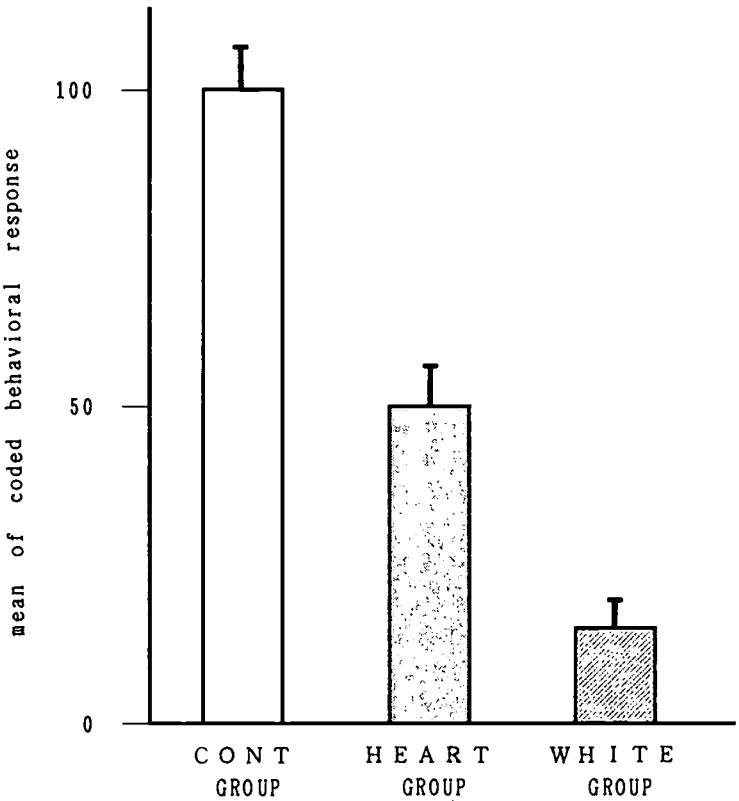

Figure 4. Means of codes behavioral responses. Standard error of the mean is indicated by the line above the bar.

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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INDIVIDUAL DIFFERENCES IN TODDLERS' EMOTION REGULATION: THE RELATIONSHIP BETWEEN CHILDREN'S PROBLEM-FOCUSED COPING STYLE AND MATERNAL RESPONSE STRATEGIES TO THEIR NEGATIVE EMOTIONS.

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Abstract

The relationship between children's problem-focused coping strategies observed in a problem solving task (the barrier situation) and four types of maternal daily response strategies to their children's negative emotions (restraint/punishment, attention-control, soothing, and reasoning) measured by the questionnaire was examined. Twenty-seven 18-month-toddlers were observed in the barrier situation. In this situation, the children were required to open the box where their desired toys were, which was beyond the capacity of the children of this age. We focused on help-seeking behaviors as the children's problem-focused coping strategies. The children were classified in four groups in terms of help-seeking from their mothers and from the experimenter. It was indicated that of four types of maternal response strategies, only restraint/punishment related to the children's help-seeking behaviors. However, maternal restraint/punishment did not relate to whether the children sought help or not, but related to whom they sought help for. The results were discussed in terms of children's perception of their mothers' availability and the development of children's independence.

Key Words: 18-month-toddler, barrier situation, problem-focused coping, maternal response strategies, individual difference.

Emotion regulation has been recognized as one of the key concepts in the study of socioemotional development (Kopp, 1989; Thompson, 1990). The acquisition of the skills to regulate one's own emotion is seen as a developmental task during infant-toddler period. Emotion regulation is defined as "the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals (Thompson, 1994,

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Pp. 27-28)." Many theorists as well as Thompson use the term emotion regulation to refer to both an individually based and a relational phenomenon. Caregivers play a significant role in helping their children to regulate their emotions, especially in the first few years of life. And then the agency of emotion regulation shifts from caregivers to children (Kopp, 1989). That is, an emotion is externally managed and increasingly self-regulated with development. It seems reasonable to assume that individual differences in emotion regulation are defined innately to some degree (Rothbart & Derryberry, 1981), but socialization factors also have some influences on children's emotion regulation development. The purpose of this study was to examine the relation between children's emotion-regulation styles and maternal response strategies to their children.

Coping theorists also deal with the same phenomena as emotion regulation, especially regulation of negative emotions. Lazarus & Folkman (1984) differentiated two modes of coping, problem-focused coping and emotion-focused coping. Problem-focused coping involves active efforts to modify the source of the problem, and emotion-focused coping involves efforts to reduce emotional distress.

Individual differences in emotion regulation in infancy have been referred to in the attachment studies. Attachment is defined as an affective bond between an infant and his or her caregiver that develops over the first year of life (Bowlby, 1969). Different attachment styles are thought be associated with infants' emotion regulation styles when they interact with their attachment figures (Thompson, 1990; Cassidy, 1994). Attachment style which is usually measured by the Strange Situation Procedure (Ainsworth, Blehar, Waters, & Wall, 1978). Would reflect infant's emotion regulation style during the brief separation from the mother. Though not examined directly, the relations of infants' emotion regulation styles and maternal characteristics have been suggested. Avoidantly attached infants, whose mothers are characterized as rejecting and unresponsive (Egeland & Farber, 1984), showed less distress and more self-oriented behaviors in the Strange Situation (Braungart & Stifter, 1991). On the other hand, ambivalently attached infants, whose mothers are characterized as unresponsive or inconsistently responsive (Isabella, Belsky, & von Eye, 1989; Isabella & Belsky, 1991), expressed high levels of distress and high levels of people orientation during separation (Braungart & Stifter, 1991).

However, some questions remain to be explored in prior studies. First, despite considerable researches on individual differences in emotion regulation in the attachment studies, their concerns are limited to individual differences in emotion-focused coping, and individual differences in problem-focused coping have scarcely been examined. One of the reasons for this is that problem-focused coping has not yet emerged in the first few years when the Strange Situation Paradigm is applicable to. Second, in considering relations between the children's emotion regulation styles and maternal characteristics researchers have focused on, only global constructs such as maternal sensitivity or maternal responsiveness irrespective of children's emotion regulation. Therefore, which aspects of maternal responses to their children's emotions relate to children's emotion regulation behaviors is unclear. In a word, no study has been conducted to investigate the relations between children's problem-focused coping

and maternal usual behaviors to their children's negative emotions.

To examine this issue, we focused on toddlers aged eighteen months because it has theoretically been claimed that problem-focused coping emerges in the middle of the second year (Kopp, 1989). We used a barrier situation (van Lieshout, 1975) as a problem-solving task to assess the toddlers' problem-focused coping. In this situation, children's efforts to remove the barrier by themselves and to seek help to get the desired object could be seen as problem-focused coping behaviors. In considering the relations of children's coping behaviors and maternal behaviors, we especially took note of help-seeking for the following reason.

Toddlerhood is characterized as the beginning of the separation-individuation process, or the emergence of autonomous self. Toddlers' increased intentionality would sometimes face the limitation of their ability or the restraints placed on by their caregivers inherent in increased socialization pressure. Therefore, toddlers have to deal with frustrations accompanied with these limitations (Mahler, Pine, & Bergman, 1964; Sroufe, 1996). Waters & Sroufe (1983) suggested that the central issue in this period is to be able to draw upon resources and to deal with opportunities and challenges in the environment. For example, in a problem-solving situation, movement toward autonomy is indicated by flexibility, resourcefulness, and ability to use adult assistance without being overtly dependent on it. Thus, seeking help from others in such a situation is thought to reflect a major aspect of children's competence of this age.

What kind of maternal behavior is expected to be associated with the children's problem-focused coping behaviors (help-seeking) then? It is not clear in fact, but some relations between chidren's social competence level and maternal socialization strategies concerning their children's negative emotions were reported in preschoolers. That is, maternal punitive attitudes to their children's negative emotions were negatively related to children's social competence, and maternal comforting responses were positively related to children's social competence (Eisenberg, Fabes, Carlo, & Karbon, 1992). Given the competence of this age, it is predicted that maternal punitive behaviors to toddlers' nagative emotions relate to less help-seeking from others, and maternal empathic behaviors (e. g., soothing) relate to more help-seeking from others.

Method

Subjects: 27 toddlers aged 18-month-old (18 boys, 9 girls) and their mothers participated in this study.

Apparatus:

5 kinds of toys (kitchen utensils for playing house, some small cars, a toy piano, a ball made of cloth, and a stuffed animal) were prepared to play with.

A clear plastic box was employed as a container for the toys. The children could see the toys in the box from the outside. The box could be locked by the handles attached to the lid of the box. The children would know how to open the box, but it was difficult for them to take off the lid. The box was not so heavy and big that the children could carry it or push it across the floor.

Procedures :

Measurement of children's problem-focused coping.

Two female experimenters visited the subject's home and the experiment was conducted in a room of the house.

Barrier situation task consisted of two episodes. 1. The child and mother played together with the toys for 5 minutes (Episode 1). 2. Following a 5-min period of the interactive play, the experimenter interrupted their play and began to put away the toys in the box. When all the toys were put away and the lid was put on, the experimenter sat in front of the child and presented the box saying, " Here are the toys in the box. Can you open this box ? " The experimenter prompted the child to open the box every 30 seconds. This episode lasted for 3 minutes (Episode 2). After 3 minutes, the experimenter said to the child, " You have tried hard. Let's open the box together.", and helped the child to open it. During the second episode, the mother was seated on the floor next to the child and was engaged in filling out the questionnaire. The mother was instructed not to help the child actively. When the child came to seek help from the experimenter, she encouraged the child to try by him/herself. All of the child's behaviors were videotaped.

Classification of the children in terms of help-seeking.

The following behaviors were regarded as help-seeking from others. : Carrying or pushing the box to the mother or the experimenter, Taking the mother or the experimenter by the hand, Saying " Open it." to the mother or to the experimenter.

The occurrence of these behaviors was checked. The children were divided into 4 groups in terms of help-seeking from others, that is, the children who sought help from both the mother and the experimenter (group 1, n=5), those who sought help only from the mother (group 2, n=7), those who sought help only from the experimenter (group 3, n=9), and those who sought help from neither the mother nor the experimenter (group 4, n=6). Percent interraters agreement for the children's classification was 96.3%.

Measurement of maternal responses to their children's negative emotions.

Maternal response strategies to their children's negative emotions were assessed by Maternal Response Style Scale developed by the author (Sakagami, in preparation). Mothers were presented 7 typical situations in which children are likely to experience distress and negative emotions. For each situation, mothers were asked to rate how likely they would be to react in each of 4 fashions by means of five-point-scale (1 : never−5 : very often). Four types of strategies included restraint/punishment (e. g., command the child to be quiet, put restraints on the child's behavior. α=.86), attention -control (e. g., shift the child's attention by showing toys etc. α=.89), soothing (e. g., hold the child, give empathic words to the child. α=.88) , and reasoning (e. g., explain the causes of their distress, explain why the child has to comply with the mother's request. α=.86) (Alpha coefficients are in parentheses). Each type of strategies consisted of two to four items. The mean score across seven situations was used as a score for each strategy type. Seven situations could be divided into two different kinds

by confirmative factor analysis, one concerning children's physiological changes and environmental changes (four situations), another concerning discipline (three situations). The mean score for each strategy type to each of the two was also calculated. Alpha coefficients for all maternal variables to each kind of situation were above. 77

Results

One way analyses of variance with one between-subjects factor (child's help-seeking) were performed for the scores of four maternal strategy types across all situations. The analyses of variance showed a significant group effect on maternal restraint/punishment ($F(3, 23)=3.99$, $p=.02$). Differences between separate means were tested by Scheffe's test. Contrasting separate means revealed a significant difference between group 2 and group 3 ($Mse=0.16$, $p<.05$), suggesting that the mothers of the children who sought help only from the experimenter used restraint/punishment more frequently than those of the children who sought help only from the mother. No significant differences were found for attention-control, soothing, and reasoning (Table 1). (The raw score of maternal restraint/punishment was not normally distributed. Therefore Kruskal-Wallis test was used to confirm the difference shown by the ANOVA. This analysis also indicated significant difference between groups ($H=8.11$, $p<.05$).)

Next, as the significant group effect was shown on maternal restraint/punishment by the ANOVA, further analysis was conducted on this variable. Two way analysis of variance with one between-subjects factor (child's help seeking) and one within-subjects factor (situation) was conducted. A significant group effect was found, ($F(3, 23)=4.01$, $p=.02$). A significant group × situation interaction effect was also found ($F((3,23)=3.93$, $p=.02$) (Fig. 1).

Table 1. Maternal response strategies to their children's negative emotions.

	Group 1 M SD	Group 2 M SD	Group 3 M SD	Group 4 M SD
Restraint/Punishment	1.60(0.46)	1.48(0.35)	2.12(0.36)	1.89(0.46)
Attention-Control	2.02(0.25)	2.30(0.86)	2.64(0.46)	2.31(0.29)
Soothing	3.21(0.56)	3.31(0.63)	3.29(0.40)	3.09(0.60)
Reasoning	3.23(0.68)	3.01(0.94)	3.40(0.32)	2.97(0.60)

Discussion

Individual differences in toddlers' problem-focused coping behaviors in terms of help-seeking from others and their relations to maternal response strategies to their children's negative emotions were examined in this article.

It became apparent that of four maternal response strategy types, only restraint/punishment was significantly related to the children's help-seeking behaviors. Contrary to our prediction, however, maternal restraint/punishment did not relate to whether the children sought help or not, but did relate to whom the children sought help from. That is, mothers of those who used only their mothers as a helper had the lowest restraint/punishment score, and mothers of those who used only the experimenter as a

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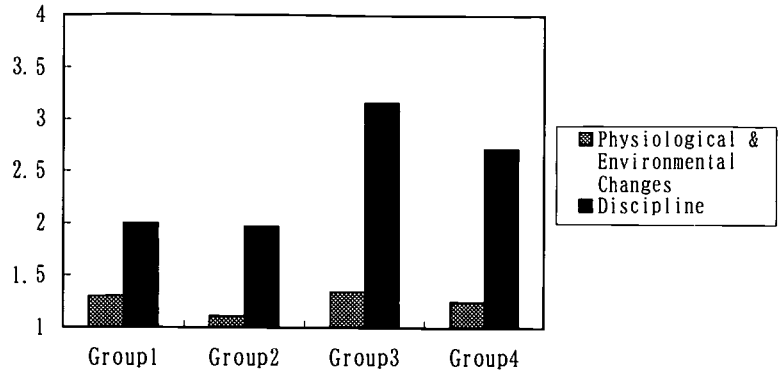

Figure 1. Group-differences of maternal restraint/punishment in each situation.

helper had the highest restrain/punishment score of the four groups. Especially in the score of restraint/punishment to the situations concerning discipline (not to the situations concerning children's physiological changes and environmental changes), a major difference was found between these two groups.

Two interpretations are possible about this result.

The first interpretation concerns the general maternal availability perceived by the children. It is assumed that the children classified in the group 3 usually received restraints on their behaviors in their daily lives, so they might have perceived their mothers less available for getting the objects they wanted in the experimental situation. Therefore they might have sought help from the experimenter at hand. On the contrary, the children who received less restraints in their daily lives might have estimated maternal availability highly and sought help from their mothers in the experimental situation.

The second explanation concerns the development of children's independence. Perhaps all the children would know who hid the toys in the box and asked them to open that box (=experimenter). Moreover, the experimenter was located closer to the child during the barrier situation. Therefore, restricted to that situation, seeking help from the experimenter would be the most natural way of solving the problem.

Maternal restraint/punishment seems to reflect the strictness of socialization and maternal expectation for their children's independence (self-control), especially in the context of discipline. It is expected that moderate maternal restraint/punishment facilitates the children's independence. Note that the maternal restaint/punishment score of group 3 children was not extremely high, although it was relatively high compared to that of the other groups. So the children of group 3 are assumed to have developed the ability of coping with problems without relying on their mothers or the ability of relying on others except their mothers when their mothers are not available. Therefore, they could easily use the experimenter as a helper though they were not acquainted with her before. On the other hand, the children of group 2 would not have fully developed such ability and seemed to be unable to use the experimenter as a helper.

We have to refer to the children of group 4, who sought help from neither their mothers nor the experimenter. It is possible that different kinds of children were

compounded in this group, that is, those who could well regulate their emotions by effectively using emotion-focused coping strategies (e. g., active distraction), and those who haven't developed the mature coping strategies such as help seeking or effective emotion-focused coping strategies. Further examinations will be needed about the children of this group.

Our hypothesis about the relation of the children's problem-focused coping and maternal empathic attitudes (e. g., soothing) was not supported. These two constructs may not be related in fact, but other explanations are also possible. One is that although they have some relations potentially, they were not observed in our study. Another is that maternal empathic attitudes may not relate to children's problem-focused coping strategies, but relate to emotion-focused coping strategies, which we did not examine.

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