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A STUDY OF MATERNAL TOUCHING OF NINE-MONTH-OLD INFANTS BASED ON NATURALISTIC OBSERVATION

by

David Sard

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

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ABSTRACT

A Study of Maternal Touching of Nine-Month-Old Infants
Based on Naturalistic Observation

by

David Sard

Adviser: Ruth C. Resch, Ph.D.

The purpose of the study was to generate operational categories and hypotheses regarding maternal touching of infants. Seven normal mother-infant pairs were examined using videotaped observations in a social setting. The infants were all nine months old, were evenly mixed racially and sexually, and came from similar socioeconomic backgrounds. A "propaedeutic" analysis was done: the observations were reviewed and compared repeatedly, until systematic patterns emerged, which were then retested against the body of the data. The data-based hypotheses generated by this means included: (A) A classification of touching interactions with respect to levels of synchrony and dissynchrony in the interaction was developed. The temporal and patterned character of synchrony and dissynchrony in touch was examined in extended episodes of touching. (B) Touching interactions were characterized by an ongoing state of mild dissynchrony during free play, punctuated by brief peaks of highly joined activities involving shared attention, close cooperation, or visual engagement, all of which are seen as forms of synchrony. (C) The patterning of synchrony and dissynchrony in touch may be a means for regulating the infant's attention, perception, level of engagement, and affective tone, thereby facilitating peaks of synchrony and dissynchrony.

PERSONAL STATEMENT

This dissertation has many parents. The bulk of the credit goes to Ruth C. Resch, who gave generously of her intellectual clarity and integrity, and taught me invaluable observational and analytic skills. Arietta Slade was tremendously helpful in clarifying my thinking and especially in the crucial task of bringing the project to a conclusion. Larry Gould did not fail in offering vital support and encouragement through many crises.

I selected this topic primarily on the basis of my interest, but I have been fortunate in that this project has turned out to be complimentary to my observational and clinical skills. The making of the observations, narratives, and analyses, and the reviewing of them with my various mentors, especially Dr. Resch and Dr. Slade, challenged my ability to observe and to think about behavior. In the earlier stages of my training there have been many others who have challenged, supported, or inspired me at critical points: Robert U. Akeret, who inspired me to become a psychologist; Laurence Epstein; Jane Monroe; Mary Engel; Paul Wachtel; Anneliese Riess; Arthur Arkin; Michael Bramante; Pearl Gordon; Sandy Hendricks; and Reuben Margolis. Finally, none of this would have been possible without the ongoing encouragement and help of Robert U. Akeret and Susan Warshaw.

Family and friends play a difficult part in doctoral and clinical training. They must remain spectators through a long period of unresolved, anxiety-ridden striving. To all those who have waited and encouraged me through my gestation and labor pains, especially my wife and

daughter, Sarah and Kristen Sard, my father, Robert Sard, Nancy Duggan, Andrew Tatarsky, David Frieder, and to all who have given their blessings to this enterprise, I say, thank you. Finally, a special debt is due to Kari and Reidar Bornholdt, for the many hours of typing, word-processing, and computer-wrestling that were needed to get this project onto paper.

Contents

I. INTRODUCTION TO THE STUDY

Bertrand Russell observed that the sense of touch is the foundation of the sense of reality. (1925) It has become a commonplace that early tactile contact is a necessity for normal infant development. (Gardner, 1972; Harlow, 1973; Lipsitt, 1979; Montagu, 1978; Thayer, 1982) In reviewing the social aspects of touching, Thayer wrote: "Perhaps because of its primitive and intense signaling value, the type, location, and quality of touching may even override other kinesic and paralinguistic signals." (1982, p. 264) I began this study with the hope of investigating whether the infant's experience of being touched and handled by the mother is incorporated into the "sense of self". It quickly became a more practical project: the study is intended to generate operational descriptions of mothers' touching of their infants, with particular attention to synchronous and dissynchronous aspects of touch, using naturalistic observations in a hypothesis-generating method. This method was used in view of the fact that while much is known on the physiology of touch, it is not yet clear what the significant questions are regarding the psychological importance of touch. The importance of touch for early psychological structuralization has become apparent . (Resch and Grand, 1985) Examination of the literature shows that little work has been done on describing parental touch as a phenomenon. This study is an effort to address that need.

II. REVIEW OF THE LITERATURE

Introduction

Touch presents difficulties for study because it is intertwined with other sensory and psychological experience. Parental touch often appears as the background of an interaction; sometimes it appears ephemeral or of unclear meaning. Thus it has not often been studied in itself or in detail, except from the physiological point of view. (See Weiss, 1984, and Day, 1982, for examples to the contrary.) In the past touch has often been conceived of as a unified, consistent phenomenon and has been studied in a general way. For example, various outcomes in infants or in the mother-infant relationship have been compared under conditions of touch versus non-touch. (Harlow, 1973; Klaus & Kennell, 1983; Suomi, 1984) Another mode of study is seen in the work of Ainsworth et al. (1978), in which a judgement on overall quality of maternal touch was made on the basis of numerous observations. Or, touch has been dealt with theoretically, usually in passing, as a more or less consistent sensory experience which affects specific aspects of psychological development. (Mahler, 1952, Frank, 1957, A. Freud, 1965, Grand 1982) Some authors have dealt with the variability of sensory interaction, but only in general or in regard to other sensory modes, such as vision (Brazelton, Koslowski, and Main, 1974, Beebe and Stern, 1977, Brazelton and Als, 1979, Day 1982) As a result much of this review deals with work that "touches on " the subject of touching but does not deal with it directly.

I will review evidence that touch is a nutriment, an organizer, and a regulator of maturation for the infant. Maturational factors which may limit the development of psychological structures in the infant will be reviewed. Current concepts in mother-infant interaction research which have implications for the study of touch will be defined; that is, regulation, organization, reciprocity, negotiation, and the concept of the importance of the infant's enjoying moments of uninterrupted contemplation. Next, the literature relating directly or indirectly to touch is reviewed from three perspectives: (1) the development of psychological structures in the individual (the psychological perspective); (2) the development of mutual interregulation between mother and infant (the interaction perspective); and (3) the development of the mother-infant bond (the attachment perspective). Those aspects of touch which appear to be observable and critical for development are summarized.

The Physiological View of Touch

Specific aspects of physiological development are enhanced by physical contact between mother and infant in a variety of mammalian species. Respiratory activity, immunological competence, physical growth and homeostasis, energy level, physiological responses to stress, physiological adaptation to birth and to nursing, and ability to cope with fear are improved by touching. (Klaus and Kennell, 1983; Levine and Stanton, 1984; Reite, 1984) Thus it seems appropriate to speak of touch as a nutriment, as Grand does in his study of the connection between deficits in the early development of the body ego and

schizophrenia. (Grand, 1982) Various theorists have proposed that there is a primary need for skin contact. (Bowlby, 1969) Shevrin and Toussieng make a strong case for the existence of a drive to attain tactile stimulation in manageable doses. (1962, 1965)

Various indirect mechanisms for the nutritive and enabling effects of touch have been proposed (Levine and Stanton, 1984, Reite, 1984) Touching may also be a structural physiological nutriment. Since respiration, physical growth, and activity levels in human infants are increased by touching, Central nervous system (CNS) growth is presumably increased as well. This has been demonstrated in the rat. (Montagu, 1978)

This raises the question of whether the level of physiological maturation of the infant limits its psychological development with regard to those processes influenced by touch-experience. The tactile system is one of the first to mature. The fetus responds to tactile stimulation eight weeks after conception, and is subject to constant input from the movements of the mother and of the amniotic fluid. Birth of course, involves intensive tactile stimulation. (Thayer, 1982) During the first year of life, cortical development advances furthest for sensory and primary motor functions. Although all sensory capacities are functioning soon after birth, the sensory areas mediating tactile experience mature earlier in their totality than other sensory areas. An exception is the visual-motor system, which coordinates eye and head movements, visual tracking, etc. It reaches functional maturity by the third month, earlier than the other motor systems. (Bowlby, 1969; Stern, 1974) During the second half of the first year, the visual asso-

ciation areas become the site of the most rapidly accelerating development. Prefrontal development continues to lag for the first two years of life. A similar developmental sequence has been observed in other mammals and in birds. (Greenough, 1984)

How does the infant experience touch ? Particularly, to what extent are representation and conscious association involved in the infant's experience of touch? At first, touch is experienced by the infant in a broad, generalized way. Often, for example, it takes time for the infant to learn to discriminate between touch and pain. (Montagu, 1978, Freud, 1965) As the sensory apparatus matures, the infant is more and more able to localize sensation. Localization proceeds most rapidly from the 7th to the 16th months. (Montagu, 1978) The mother's modulation and organization of her infant's tactile experience can enhance or delay the child's ability to absorb new information and to learn about its own body through tactile experience. (See Resch, Grand and May, 1983, for an explicit example of tactile learning and neurosensory maturation being fostered by maternal interventions.)

Vestibular stimulation has a powerful effect and is usually associated with touch. Bowlby points out that infants do not habituate to rocking. (1969) It appears that in early stages vestibular stimulation alone is more powerful than cutaneous or haptic stimulation. (Montagu, 1978, Korner, 1984). Paul Schilder held that vestibular experience furnishes the most fundamental ego-nuclei around which the body-ego will crystallize later on (cited in Grand, 1982).

Speculations about infant tactile experience are complicated by the fact that CNS development is not a matter of uniformly incremental

growth of neurons and synapses. Rapid growth in a part of the brain is not necessarily an indicator of enhanced function in the corresponding skills. In addition, there is evidence that some CNS cells can modify their function without a corresponding change in the number of synapses, as in the case of recovery of cutaneous sensation after severing of a nerve. (See Merzenich, 1984, as well as Greenough, 1984, and Brazelton, 1984) However, it is clear that tactile experience is a major part of the infant's experience and that it is mediated by cortical structures.

In its mature state, and probably earlier, the tactile system is capable of integrating responses from several subsystems: (a) cutaneous stimulation; (b) haptic stimulation, affecting the cutaneous sensory system and including joint or muscle movement; (c) dynamic stimulation, which adds the element of muscular exertion; (d) touch temperature stimulation, which adds the element of vasodilation and vasoconstriction; and, (e) oriented stimulation, which includes all of the above and vestibular stimulation. The perceptual capability of the haptic system is impressive: it can differentiate texture, temperature, shape, slope, curvation, hardness, weight, elasticity, pliability, resiliency, and wetness. (Thayer, 1982)

Thus the infant's tactile experiences seem to be incorporated into the memory and associational bases of psychological structures. Bronson, however, maintains that such experience is mediated by lower brain structures primarily and therefore must be superseded by, not incorporated into, "true ego development". (Bronson, 1963)

Relevant Concepts in Mother-Infant Interaction Research

The earlier view of development as a sequence of fixed states and tendencies has been superseded by the interactional point of view. Development is now seen as a flexible process carried out in the course of an evolving interaction between the infant and the environment, especially the caregiver. (Sander, 1983) Recent research has emphasized the infant's share of the interaction and the infant's effect on the mother's behavior. (Lewis and Rosenblum, 1974, Brazelton and Als, 1979, Beebe and Stern, 1977, Emde, 1983, etc.)

Mothers and infants are now seen as regulators of one another's attention, arousal level, and internal state. (Sander, 1965, Brazelton, Koslowski, and Main, 1974, Beebe and Stern, 1977, Emde, 1983) Regulation is used here in Sander's sense to mean an "ordered exchange". (1983) As Beebe and Stern point out, interregulation is often carried out through micromomentary communications and responses. These are often too fast to be appreciated by an observer or to be within the infant's or the mother's awareness. In effect they are powerful subliminal communications. (Beebe and Stern, 1977) Presumably they are physiological as well as psychological in their effects. (Cf. Levine & Stanton, 1984

Mother and infant are also seen as providing organizers for one another, in the sense of developmental events or changes which determine subsequent development in specific ways. (Sander, 1983) The infant's responses reinforce the mother's actions, and the mother's interventions shape the infant's developing sense of ability to manage its internal

state, its attentional processes, and its experience of self and other. (Brazelton and Als, 1979, Beebe and Stern, 1977, Resch, Grand, and Meyerson, 1981)

For example, Sander (1982), has proposed that early state experiences may furnish the nuclei around which memories, associations, wishes, impulses, and coping patterns align themselves. Thus the most fundamental form of the ego may be a "state-ego". Many of the mother's attempts to manage the infant's state involve touch; from this point of view, then, tactile experience would be among the most fundamental components of the early ego, either as organizer or as regulator of psychological development.

Reciprocity is another aspect of mutual regulation. As formulated by Brazelton et al., the mother's and infant's inter-regulation is characterized by interdependent rhythms of attention and withdrawal on both sides. If the mother responds in a nondisruptive but stimulating way to the infant's fluctuating attentional states, the infant will be able to focus on and to learn about the environment. (Brazelton, et al., 1974)

The concept of negotiation was first emphasized by Erikson (1950). He holds, along with others, that a manageable level of frustration is essential to development (Freud, 1911, Winnicott, 1960/1965). As expounded by him and elaborated by Brazelton et al. (1979) and Sander(1983), the concept of negotiation refers to the cycles of dissynchrony, disruption, compromise, and adaptation which mother and infant work through repeatedly as the relationship evolves. Successful working through of these struggles at different developmental levels is an

important factor in the infant's perception of itself as a human being. It affects its ability to manage its own internal state, and furnishes the groundwork for the further development of coping skills. (Brazelton, et al., 1974,1979; Sander, 1976, 1983)

Sander (1983), following Winnicott (1958/1965), notes the existence of a state of contemplation or awareness in the infant during which, theoretically, the child is open to experience and able to internalize its experience of itself and of others. This becomes the basis of independence and relatedness. This state is fostered by the mother's engaging the child in a reciprocal relationship, in which the infant is allowed to engage and to disengage autonomously. The child cannot allow himself to withdraw without the security of feeling engaged with the mother; thus early experiences of being "alone with the mother" (Winnicott, 1958/1965) become the basis of the child's increasing ability to manage anxiety as he becomes more distant from the mother. (Winnicott, 1958/1965, Sander, 1983). Beebe and Stern's work on micromomentary communications shows how over-engagement on the caregiver's part can lead the infant to withdraw and to block out experience. Presumably touching is another area in which the mother must find a balance between engagement and the lack of it in order to facilitate these core states of awareness.

The Psychological Perspective.

The psychological view of touch has to do with the role of touch in the development of self-esteem, self-concept, personal boundaries,

instrumentality, awareness of the other, body image, and even language. The common thread in the following studies is the notion that sensory experience furnishes a substrate for psychological structural development, particularly ego development.

Freud (1923/1962) introduced the term "body ego" for the precursor of the ego. He reasoned that the infant's experience must be dominated by physical sensation, especially proximate sensation such as hunger, pain, or pleasure in nursing. In 1927 Freud made the concept more precise: "The ego is ultimately derived from bodily sensation, chiefly... from the surface of the body.....(Ibid., 1927 edition, p. 16)"

Later concepts dealing with infantile psychological structures grew out of that formulation. Mahler, observing that failure to differentiate seemed to underlie many cases of child psychosis, proposed that the psychic representation of the body self is the real core of ego development. Thus fondling and cuddling are seen as central to development of the infant's self-image (Mahler,1952). Vestibular and state-experiences have also been proposed as the underlying basis on which the early ego is built (Grand, 1982, Sander, 1982).

Subsequent research has mapped out the development of psychological structures in more detail. Mahler, Pine, and Bergman have outlined a sequence of development in terms of differentiation (1975). In this schema, the differentiation of the self from the non-self begins as the "symbiotic" phase of separation - individuation, roughly corresponding to the 2nd quarter of life, draws to a close.

Subsequent differentiation takes place in terms of two aspects,

separation and individuation. Separation refers to the intrapsychic establishment of differentiated self and mother images, the development of a clear sense of body boundary, and the increasing tolerance of physical separation from the mother. Individuation refers to the intrapsychic aspects of autonomous functioning, such as reality-testing or perception. Separation is clearly under the influence of interchanges with the mother which are mediated by touch. At the age being observed in the present study, three developments serve to enhance differentiation, and touch would appear to be involved in the first two: bodily differentiation from the caregiver, the establishment of a special bond with the caregiver - a necessity for physical separation, and an increase in autonomous ego capacities. (Mahler, Pine, and Bergman, 1975).

Other, specific aspects of early ego functioning are related to maternal touching. The achievement of a sense of boundedness and cohesiveness is an aspect of psychological structuralization which would seem to be related to experiences on the body boundary. (Grand, 1982) Hoffer proposed that libidinization of the body is a prerequisite for the development of a body image and of a sense of having a body boundary. It also serves to safeguard the infant against oral-sadistic pressures, which appear around the fourth month. (Hoffer, 1950).

Anna Freud described the difficulty of achieving a sense of boundedness and physical coherence, as mother and infant experience their own wishes to merge and the child experiences difficulty in distinguishing between internal and external. She too held that the sensitivity of the skin contributes to the evolving definition of self. In her view the

mother's touching of the infant is critical for libidinization of the body by the infant:

> At the beginning of life, being stroked, cuddled, and soothed by touch libidinizes the various parts of the body, helps build up a healthy body image and body ego, increases its cathexis with narcissistic libido, and ...promotes the development of object love... The surface of the skin in its role as erotogenic zone fulfills a multiple function in the child's growth. (Freud, 1965, p. 199)

In her view, then touch has great impact, not only on the sense of personal boundaries, but also on the sense of me/not me and of self-esteem. (Freud, 1965)

Self-esteem, another aspect of ego functioning, may be affected by more subtle aspects of touch. For the infant, the experience of gaining mastery over one's internal state and of "entrainment" - the matching of the mother's and the infant's interlocking rhythms of attention and withdrawal - are powerfully gratifying to the infant. (Brazelton and Als, 1979) If such experience is a basis of self-esteem, then touch plays a role in its' development, to the extent that mothers use touch to manage their infants' or to regulate their attention. Mothers differ in this regard, according to a preliminary examination of our data. (See Brazelton, Koslowski, and Main,1974)

Winnicott assigned an important role to touch in the differentiation and the consolidation of the self (Winnicott, 1958, 1960/1965). Most models of development are basically derived from the developmental

sequence of unfolding infant capacities. Winnicott, on the other hand, spoke of stages of care, a model derived from Rickman's notion (cited in Winnicott,1960/1965) of the one, two, and three- person relationship sequence of development. Winnicott's stages of care are:

1. holding,

2. mother and infant living together, and

3. father, mother, and infant living together (1960/1965).

Winnicott's contention is that if the child feels securely "held", that is, cared for, the child will master his infantile terrors, achieve some structural integration and move on to higher levels of functioning. Thus the child develops a sense of me/not me, of inner versus outer, and self versus other, one constituent of which is the awareness of having one's own body boundary: "... a limiting membrane, which to some extent in health is equated with the surface of the skin." (Winnicott, 1960/1965, p. 41)

Winnicott says that brief experiences of disorganization are crucial for maturation of an autonomous self (1958, 1960/1965). These are moments of free-floating psychic attention and contemplation, during which the infant is most truly himself. However, these moments cannot occur if the infant does not feel reliably "held". These brief experiences of disorganization become the private core of the self and the adequately "holding" parent is one who is careful not to violate them. Otherwise, adequate holding consists of the following:

1. The mother must provide physical protection.

2. The mother must take account of the infant's sensitivity to touch, temperature, auditory and visual stimuli,

and to gravity.

3. The mother must take account of the infant's lack of knowledge of the world outside itself (Winnicott, 1960/1965).

In a subsequent article Winnicott deals with touch and the infant's task of "creating" the object. The object develops from a "subjective phenomenon" to an "object objectively perceived".

> The change of the object... to "objectively perceived" is jogged along... by dissatisfactions... Instinct gratification does but little to the position of the object.
>
> ...The infant's experienced aggression, that which belongs to muscle erotism, to movement, and to irresistible forces meeting immovable objects, this aggression, and the ideas bound up with it, lends itself to the process of placing the object, to placing the object separate from the self, in so far as the self has begun to emerge as an entity. (Winnicott, 1963/1965, p.181)

Thus frustration and especially frustrated aggression experienced on the body boundary through physical contact and restraint facilitate differentiation, in Winnicott's view.

Grand (1982) explains the cognitive distortions seen in schizophrenia in terms of the connection between infantile somatosensory experience and body ego development. Tactile stimulation is considered a "sensory nutriment" in that it is an organizer of various aspects of ego functioning: the sense of body boundaries, the sense of separate existence, of instrumentality, of me/not me, and of coherence of the "cohesive body self". Following Mahler, Grand emphasizes the importance

of sustained, repeated bodily contact between mother and infant for the demarcation of self from non-self. His point is that schizophrenic symptomatology comes from attempts to ward off the experience of regression to autistic or symbiotic states and resulting fears of disintegration, engulfment, or annihilation which accompanies that regression. Grand holds that self-generated somatosensory experience is a fundamental part of attaining a coherent, independent body self. In his schema, the sense of boundedness is attained first, followed by the sense of instrumentality, which in turn is a prerequisite for self-object differentiation. (Grand, 1982)

Resch and Grand (1985) have explored the process of the construction of infantile psychological structures and their endowment with meaning during the symbiotic phase. This process requires sensory experiences in the reciprocal mother-child interaction. Starting from Mahler's concept that the differentiation of the body image is the core of the child's ego, Resch and Grand give a more detailed picture of the change from a primarily biological symbiosis to a primarily psychological symbiosis.

In their words: "The fundamental task of the psychological symbiosis is the establishment and preservation of the symbiotic partner intrapsychically" (1985, p.422). This is the beginning of dynamic intrapsychic life, following the recurrence of cycles of sensory experience of the infant's own and his mother's body, and through recurrent experience of observation, imitation, and action on his body, on his mother's body, and on inanimate objects. The gratification of reciprocal play is an important motivating factor. (See

Brazelton & Als, 1979) At first the cumulative effect of these experiences is to lead to increased specificity of sensitization and an increasing articulated body experience, to a heightened sense of the existence of a "body self" and increased focal attention. This beginning awareness of the self is followed by recognition of the maternal object. As the infant "hatches" from the symbiotic phase, the object is preserved and endowed with meaning. This is the beginning of object constancy and representation.

They draw on the example of the psychotherapeutic treatment of an autistic two-year-old girl by Resch. (Resch, Grand, and Meyerson, 1981) The treatment consisted of a carefully paced and modulated sequence of sensory and interactional interventions, with the mother as mediator. The goal was to overcome the child's screening out of stimuli through autistic behaviors and to invite her into the world.

Resch et al's work with Luisa shows how the mother's "buffering and organizing inner and outer stimuli" works (Mahler, 1958, cited in Resch et al, 1981, p . 299). The guiding principle of this treatment, as they describe it, was that, "The arena of treatment should be the baby's range and use of perception, attention, stimulus thresholds, stimulus-modulating mechanisms, pacing, synchrony, and sensory-motor integration...We understand these to be the biologic and organic matrix for the development of the self and of object representations,the foundations of psychological development"(1981, p. 286).

In practical terms, this involved teaching the mother to play with her autistic baby in ways the child could respond to. Luisa was gently discouraged from her symptomatic behaviors. Sensory experience was made

manageable for Luisa by engaging her interest in textures and in rubbing. Pacing was adapted to Luisa's easily violated stimulus thresholds. New experiences related to familiar ones, such as her repetitive rubbing of the backs of her fingers against various surfaces, were offered but not pressed upon Luisa. Frequent rest periods allowed her to withdraw - but only briefly. Slow, deep stroking, back rubs, and vestibular stimulation through rocking kept her engaged. Face-to-face encounters were difficult for Luisa to handle, although she enjoyed having her face rubbed by another face in a side-to-side position. One activity which was found to lead to tolerance of increasingly complex activity consisted of the mother gently putting Luisa's hands and arms through activities she had shown interest in, such as shaking toys.

As treatment progressed, Luisa demonstrated increased attention to the environment, increased intentionality, increased engagement with people, and began to manage and tolerate stimulation, even when it was occasionally excessive. (Resch, Grand, and Meyerson, 1981)

While normal infants do not require anything like the level of sensitivity involved in this treatment, it illustrates in magnified form how the mother functions as a "facilitator and mediator of sensory thresholds, reception, and processing," during the symbiotic phase. If this model of the behavioral changes observed in the case of Luisa (the two-year-old treated by Resch) is correct, then the child's experience of being touched and handled by the mother is a fundamental building block of the sense of self and of the child's objects. (Resch and Grand, 1985)

Weiss (1964) has developed a way to study self-image in older children and produced evidence that touch is incorporated into psychological structures in specific and even measurable ways. She found correlations between 10-year-olds' body concepts and their feeling toward their bodies, on the one hand, and the various ways in which they were touched by their parents during an observation, on the other hand.

Briefly, she reports: "The qualities of touch associated with a sophisticated body concept and a positive body sentiment were of a somewhat vehement, instrumental, or dynamic nature. It suggests that a substantive level of tactile arousal maybe necessary for adequate cognitive and affective awareness of the body to occur." (Weiss, 1984, p. 133)

Weiss observed parent's touching of their ten-year-olds under very unnatural conditions. The procedure called for the parents to guide their blind-folded children for 15 minutes in a playroom, without verbalization of any kind. The interactions were videotaped, parental touch was rated, and then correlated with the children's scores on measures of sophistication of body image and of positive feeling for the body or for parts of it. Parental touching was rated according to the following categories:

1. Duration. Longer durations allow the body time to experience sensation, "which encourages awareness of one's body as separate." (p. 132)

2. Location of touch. This actually shows itself in three ways: (a) threshold, (b) extent, and (c) centripetality. Threshold is a measure of the degree of innervation of the body part touched.

(Highly innervated areas experience sharply localized sense impressions.) b. Extent is a measure of the extent of the child's body which is touched by the parent. There are indications that more extensive touching is associated with accurate body perception and high self-regard. c. Centripetality is a measure of the degree to which the trunk is touched rather than the limbs. Some authors maintain that touch of limb vs. trunk carries different meanings.

3. Intensity is judged by the extent of indentation of the skin. (Weak, moderate, or strong) Moderate-intensity touching is held to have the most therapeutic potential.

4. Sensation is an indication of discomfort versus comfort. Pleasurable touch is thought to enhance perception of the body part touched. (In this study, discomfort was observed but touching never reached the painful level. Squeezing, grabbing and pulling led to high ratings in this dimension.)

A number of correlations were found between these aspects of parental touching and their children's body concepts. The latter were measured with the Draw-a-Person test, which was scored according to Witkin's Sophistication of the Body Concept Scale, and with the Body Sentiment Index developed by Weiss, which was used as a measure of the child's positive feeling for his own body. (The Body Sentiment Index score is based on the child's sorting pieces of a puzzle representing the body into body parts which are liked or disliked.)

In fact her data suggest a more complicated result than her summary conveys, as Weiss herself points out. Sophistication of body concept in

girls is related only to certain aspects of parental touch, that is, extent of body touched and extent to which the trunk was touched. Parental touch was related in many ways to boys' body concept, however, with mothers' and fathers' touching affected the boys' body concepts in opposite ways.

The data suggest that for mothers' touching of their sons, less duration and intensity were related to positive body concept, and that touching of more highly innervated areas has a positive relation to the child's positive body concept.

The fathers' touching appeared to have a stronger effect in their touching of their sons. The child's increased sophistication of body concept was related to increasingly vigorous touching, except in terms of the touching of highly innervated areas.

There were no impressive correlations between girls' body sentiment and their fathers' touching. Girls' feeling for their bodies was positively related to intensity and discomfort in maternal touching (as in squeezing, grabbing, and pulling) Maternal handling of boys seems to foster a better feeling for the body when it is briefer, more peripheral, and covers less of the body. Again a pattern of strong instrumental touch by fathers is associated with more positive feeling for the body among boys. It appears that children may habituate to the mother's touch, so that the father's touch has more impact. (Weiss, 1984).

Weiss's findings include dramatic sex differences in the impact of touch with respect to both children and parents. Brazelton states that infants as young as six weeks expect different forms of handling and

responses from the mother and the father. (1984, p. 137) There are subtle motoric and attentional gender differences even at birth. (Brazelton, 1984, p. 138) Thayer cites various gender differences in parental touching of infants and in infant response (1982).

Weiss's study assumes that parents' touching of these latency-to-pre-adolescent children in a moderately stressful and highly unusual situation will match the fundamental touching style which each parent has evolved over the years with each child, and that the child's body concept is malleable and flexible enough that it remains dependent in some way on the way the child is touched by the parents, even at this advanced age. Whether this is true or not, her descriptive categories relating to various aspects of parental touching of their children are practical, observable, and useful.

A variation on the psychological perspective comes from Lawrence Frank, a pioneer in the study of touch, who studied the role of early tactile experience in the creation of symbols, language, and introspective thought. (1957) He appreciated the multiplicity of function of the skin in its role as the medium of "the most elemental form of communication", as an early-maturing sensory channel, and as a substrate for later communicative structures. He spoke of touch as the core of meaning upon which symbols are based. He saw the hand as a "fundamental vehicle of the structure of thought", in that it mediates the cortical representation of space, in addition to the fact that so much early learning is tactual. His point that the hand is a mediator of the child's construction of space is supported by the recent findings reported by Satz (1984) to the effect that skill in finger localization

tasks is correlated positively with reading skill in children and negatively with reading difficulties.

He offered an explanation for the soothing effects of touching in the common innervation of the sweat glands, skin capillaries, and internal organs by the sympathetic nervous system. Frank regarded touch as the child's first experience of the other. Thus he argued, all subsequent adaptations incorporate early touch experience. He saw the baby's experience of his own body, and all the associated pleasure, pain, dread, and longing, as material that would be incorporated into the self-image. Frank held that differentiation from the caregiver involved changing from primarily tactile communication to linguistic, kinesic, and symbolic communication. (Now this seems a great underestimate of the infant's prelinguistic communicative abilities.) Language, in his view, evolved from the first language, tactile communication. Because of the importance of touch as a building block of so many important aspects of experience, Frank argued that a rich sensory life in early infancy would enhance the meanings of symbols, make language richer, and facilitate differentiation. He was a proponent of the view that distortions in early tactile experience are related to cognitive distortions in schizophrenia. (1957)

The Interactional Perspective

Another relevant trend in mother-infant research emphasizes interaction. Brazelton and his colleagues maintain that, from birth, reciprocity is the basis of self-esteem and of confidence in being able

to manage oneself and the environment. They do not single out touch in their discussions, but clearly touch is an important medium of communication through which reciprocity can be attained. In their view, both mother and infant undergo repeated cycles of attention and withdrawal, of disruption and of restitution of homeostasis, during which the child and the adult shape one another's behavior. The more the mother is able to respond to the infant's fluctuating attentional states, the more the infant will be able to focus on and learn about the environment including the mother. The infant's experience of entrainment with the caregiver, and of being able to maintain itself in a state of alertness (through mother's empathic pacing of interventions) becomes the basis of a sense of mastery and self-esteem. Brazelton, et al. place a great emphasis on the infant's struggle to acquire a sense of mastery over its own internal state, and the need for the mother to provide the infant with the experience of feeling in-control through well-timed interventions. (Brazelton, Koslowski, & Main, 1974, Brazelton & Als, 1979)

"Disruptive mothering" (1974, p. 70) is that which interferes with this process and thus with cognitive acquisition. "Sensitive pacing" (p. 71) allows the infant to withdraw his attention at will, and in their data it appeared to maximize the infant's attention to the environment. They found that mothers who tried to prevent withdrawal did not get their babies to pay increased attention. They recognize that there are a variety of interactive and mothering styles within which the caregiver may be more or less sensitive. In their observations, specific behaviors had different roles in different mother-infant interactions. Thus, in one pair, smiling might be a response to performance, whereas, in another, the mother's smiling might be general, with

no specific association. They list qualities of behavior which operate in various modalities including touch: (a) Force: Light force alerts, a higher level leads to withdrawal. (b) Tempo/Duration: Depending on context, changes in these qualities can soothe, alert, or cause withdrawal. (c) Distance: The location of the interactors in space, or the location of the touch on the body, affects the saliency of the behavior.

The authors emphasize the reciprocal nature of the interaction. The baby elicits much of the "holding" and attention-directing behavior of the mother through facial expressions, movements, cries, visual interaction, touch, etc. Finally they propose a list of behavioral characteristics which are involved in maintaining the babies awareness and responsivity to the environment. These overlap the first set of behavioral qualities. They are: (a) Rhythm and Intensity, (b) Amplitude, (c) Direction, and, (d) Quality. (Brazelton, Koslowski, and Main, 1974)

Brazelton and Als point out the importance of a manageable amount of disruption and reorganization. In their view there is a tremendous reward for the infant in the experience of regaining self-control and alert attention after a disruption. Both mother and child undergo a parallel process of disruption and homeostasis. (1979) Thus the definition of disruptive vs. sensitive touching presents difficulties for observational purposes: What appears disruptive may not be so at all, but may serve a constructive purpose.

Stern and his colleagues have elaborated on the minute details of mother-infant interaction in play in an effort to map the patterns of initiation and responsiveness. He regards the mother-infant exchange as a matter of mutual regulation by which the mother and the infant

maintain optimal levels of arousal and positive affect in each other. Each uses the other's behavior in regulating his/her own. The infant incorporates the mother's signs of interest and attention into the regulation of its internal state. Stern found that during play the mother and infant constantly adjust their behavior between the infant's limits of monotony and aversion to over-stimulation in order to maintain engagement. Thus the infant gets experience in regulating arousal and affect in response to another. In Stern's words, "The issues are interest and delight in one another." (Stern, 1974, p. 190)

In 1974, Stern noted the importance of "baby talk" (p. 191), in which the mother makes communication accessible to the infant by slowing her gestures and sounds, emphasizing vowels, and exaggerating movements. Stern comments that this "deviant communication" (p. 191) facilitates the infant's acquisition of schemas of the mother around which the representation of the mother will eventually organize itself. Presumably similar considerations of pace and timing apply to touch, making touching experiences more or less desirable and/or meaningful to the infant. One difference is that touch, like sound, is something the infant can avert from only through inner, psychological withdrawal. (Habituation is not originally aversion behavior, but may be adapted to that purpose.) Referring to this property of immediacy which is possessed by touch, Thayer wrote: "Because touching another's body generates an immediate demand for a response as well as a special intimacy or threat unique among communicative behaviors, touch is probably the most carefully guarded and monitored of all social behaviors." (1982, p.266)

In another study, Beebe and Stern performed a more extensive analysis of the "spectrum of engagement - disengagement". (Beebe & Stern, 1977) This concept is based on observation of the infant's capacities for maintaining face-to-face orientation and sustained visual regard, and for modulating its experience through such measures as averting the gaze, etc. They examined videotaped observations of "micromomentary" - or split second - behavioral exchanges between mother and child, and proposed the existence of a spectrum of levels of engagement, from full engagement to disengagement. They propose that the infant's accumulated experiences of mutually-regulating sequences of exchange on this spectrum form networks of associations, which in turn are precursors of coping mechanisms, defensive operations, personal boundaries, and representations of caregivers and of the self. Many of these early exchanges are so rapid as to be out of awareness. (Beebe and Stern, 1977)

Applying their concept to the mode of touch presents difficulties, however. Their model is heavily dependent on visual interaction as an index of the level of engagement and the direction and level of attention. The infant's position on the spectrum of engagement - disengagement is manifested by the following behaviors, ranging from the most engaged to the least engaged. (Their model was based on observation of a four-month-old and his mother, but the concept is applicable to older children.)

Most Engaged <---------> Least Engaged

Facing & Looking	Side-Looking	Visual Checking	Dodging	Inhibition of Responsitivity	Fuss/Cry	Turn to Environment

Each of these behaviors can be modified further in meaning through the various "criteria of relatedness" through which infant and mother modulate their responses and regulate one another's behavior (p. 37) These criteria are:

1. Visual Attention (foveal vs. peripheral)

2. Head Orientation (full-faced vs. less direct glance)

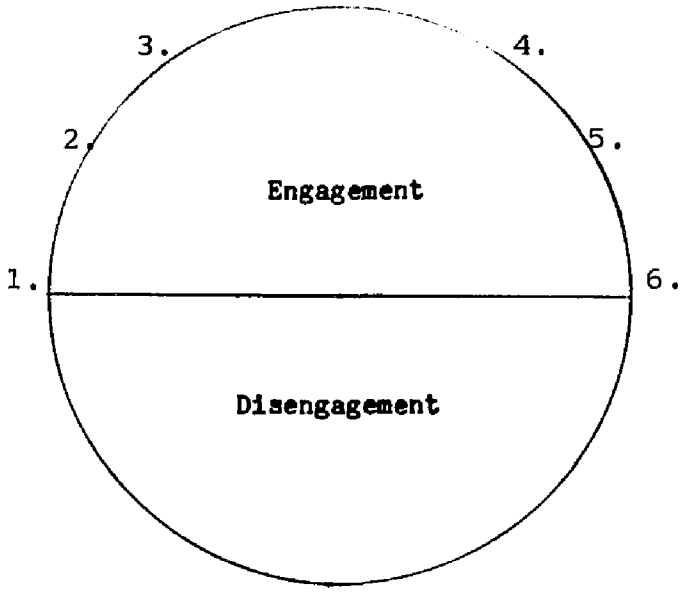
3. Reactivity (Split-second vs. inhibited or withheld reaction. Limpness or rigidity would be examples of inhibited response.)

4. Direction of Movement (Approach, withdrawal, or neither.)

5. Facial Expressivity (Receptive vs. unreceptive. Examples of receptive expression: "gape" smile, brightening face. Ex. of unreceptive: grimace, frown, tucking-in of lips.)

Items # 3 and # 4 are as applicable to touch as to visual interaction.

Engagement and disengagement in touch may also be represented graphically:



Key:

1.: Least engaged.

2.: Letting go, moving apart.

3.: Physical contact, attention elsewhere (e.g. baby supported by mother, both scanning room).

4.: Physical contact, attention fluctuating (e.g., mother holding child, both looking around and at one another).

5.: Physical contact, eliciting attention.

6.: Fully engaged (e.g. mutual hug, pushing away, escape).

The engagement-through-touch spectrum diagrammed above is drawn in a circle to represent the fact that intense involvement can lead to disengagement, as in the child's pushing away or writhing away from the mother's grasp.

Sander (1976, 1983) has described a developmental sequence emphasizing interaction for the first three years of life. In his model, the infant and mother must repeatedly negotiate more advanced patterns of interaction based on the child's advances to higher cognitive and self-management capacities. At each level the child's initiatives lead to a cycle of struggle and readjustment. At each level a key issue dominates the struggle and must be negotiated between mother and child. At each stage a new and characteristic equilibrium occurs as the issue is resolved, and this equilibrium becomes available to the infant as the "integrative core" of the personality. (1983, p. 342) His concept of the integrative core is derived from Winnicott's "intermediate area" (Winnicott, 1953) It represents the "open space" (p. 342) during which the infant is free from the press of inner or outer stimulation and contemplates himself or the environment with free-floating attention. In this somewhat disorganized state, experience becomes personal and real, and these experiences form the core of the self. Disruptions of such moments prevent the consolidation of a secure self (Sander, 1983).

The initial regulation between mother and child is based on the coordination of basically biological processes: postural maintenance, needs for quieting and arousal, etc. (1-3 months.) The issue to be resolved at this point is: to what extent will the mother's behavior be specifically appropriate to the infant's state? Then, as the infant becomes more related socially, a new level of exchange is required. (4-6 months) Increasing physical and cognitive capacities lead to repeated

experiences of uncertainty, frustration, and renegotiation over limits, boundaries, and forms of social engagement. The issue for the second phases is: to what extent will the interaction include reciprocal exchanges? Like Stern et al, Sander sees the infant as playing a major role in eliciting interventions from the mother. During the third phase (7-9 months) the infant is beginning to take the initiative in social exchange and in manipulating the environment. Negotiation has to do with the extent of independence. The issue becomes: How much will the infant succeed in establishing areas of independence?

The fourth period (10-14 months) is the period of focalization on the relationship with the mother. The issue facing the child is: to what extent will the mother respond to his initiatives, needs, and intentions? The child must determine the mother's availability, while the mother must balance nurturance and limit-setting. Later periods see the foci shift to self-assertion, awareness of inner representations, inner life, internal gratification, self-recognition, and the child's experiments with the forbidden and with anger. (Sander, 1976, 1983)

Following Spitz and Winnicott, Sander sees the infant's frustration as a critical part of distinguishing self from environment and from others, in that it forces the child to see its caregiver non-magically. (Sander, 1983) Sander notes that there is great variety in the form taken by the "synchrony" between mothers and infants during the first year. There are also different degrees of synchrony for different sensori-motor channels within the mother-child dyad. "Synchrony" is defined by Sander as a matching of stimulus and response,

of care to need (Sander, 1983, p. 132)

Many writers have examined the occurence of affectively positive shared experiences in the mother - infant interaction. "Synchrony", "engagement", and "shared attention" are related aspects of the phenomenon of synchronous behavior. "Synchrony" is defined as simultaneity of events, patterns, or rhythms by Fowler (1958) and by Webster (1985). Stern uses the term in the literal sense to refer to events that are apparently simultaneous. He describes mothers and infants socially interacting "in a split-second world", where the exchange is so rapid it must be thought of as "a shared program" rather than a stimulus and response (1977, p.84-85). He sees this not as a mystical joining but as a result of learning the timing, pacing, and movement characteristics of the other so that peripheral monitoring (or subtle tactile cues, as in the case of the data being studied here) can produce instantaneous-looking complementary behaviors. (See observation 9.)

Rocissano and Yatchmink (1984) elaborated on Brazelton et al. and on Sander's emphasis on the subtleties in the mother's fostering of the infant's attention to the environment. (Brazelton et al., 1974; Sander, 1983) They studied the ways mothers and toddlers maintained or broke off joint attention to various aspects of the context. They distinguished between synchronous and asynchronous behaviors, referring to those which serve to maintain a shared attentional focus and those which disrupt it.

Touch appears to play an important role in these processes as a signal, as an expression of joining, separating, redirecting, or disrupting attention, in addition to its other synchronous or

dissynchronous aspects. Presumably therefore it is an important medium for the exchanges which become the experiential basis of the infant's emerging sense of "me", "me vs. not-me", and self-with-other.

The Attachment Perspective

Studies focussing on the development of the bond or of attachment between child and care-giver have not dealt specifically with touch, except in animal studies. However this body of literature provides some insight into the role of touch in the development of the attachment between mother and infant. Attachment is defined here as a consistent and reliable mother-child relationship in which mother and child seek and expect one another's presence. It develops over time and in its mature form each member of the partnership discriminates the other clearly and is able to appreciate the other's point of view. (Ainsworth et al., 1978, p. 300) Attachment at the age we are considering is in a more primitive state. Bonding is a similar concept describing the connection between mother and newborn. It refers to a psychological change in the mother which the infant elicits and responds to, although the infant cannot be said to "bond" in a psychological sense until later. (Klaus and Kennell, 1983)

Freud's views changed somewhat on the role of oral nourishment and sensual pleasure and unpleasure experienced by the infant in having his or her needs attended to by the mother. However, he consistently emphasized the importance of the infant's sensory experience of the mother and of her relief of his or her physical distress. The infant

learns to love from his or her experiences with the mother (Freud, 1920/1963; Bowlby, 1969; Brenner, 1974). The extensive maternal deprivation literature makes it clear that the social interaction of a reliable relationship with a caregiver is a necessity for growth and even life itself--although there is a disagreement about what constitutes a minimally reliable relationship, and what role touch plays. (Gardner, 1976; Lipsitt, 1979; Sard, unpubl. mss.) The work of the Harlows and those following in their footsteps has demonstrated in a primate model that the lack of physical contact with the mother leads to terrible social and individual coping deficits. (Harlow, 1973) The most salient of these deficits are an inability to explore the environment and to manage social interaction, particularly sexual interaction or parenting. It should be noted that, devastating though these problems may be, they can be remediated through physical contact with substitute parents or even playmates. (Suomi, 1984) Montagu cites numerous examples illustrating the need for touching in the mother-infant relationship and the crippling effects of its absence. (1978).

However, the growth of healthy attachment, by which I mean that which fosters both autonomy and relatedness, is not a simple matter of touch versus non- touch. Attachment can be disrupted or distorted in a number of ways, and the mother's way of handling the baby can be distorted accordingly. Disrupting influences may include: (a) Psychological factors: the mother may be suffering from anxiety or depression, or she may have a personal history of insufficient or inappropriate touching in her own childhood. (Klaus and Kennell, 1983) (b) Mother and child may be mismatched in terms of personalities, or the mother's fantasies about the child may be in serious conflict with the reality. (Benedek, 1970;

Brody, 1970; Klaus and Kennell, 1983) (c) Medical stress on either mother or child may restrict touch, make it painful or difficult, limit contact in general, or heighten psychological factors, such as alarm, concern, or guilt, which may distort the mother's approach to her child. (Klaus & Kennell, 1983)

Klaus and Kennell have studied the developing bond between mother and newborn. In their view, the mother and her newborn infant have an intimate physical interaction of which touch is a major part from the beginning. The mother and baby elicit mutually rewarding behaviors involving visual fixating and tracking (the sight of the other's face is rewarding to both), sound (the newborn has been observed to be capable of "entrainment"- i.e., moving in harmony with adult speech), posture (the vestibular stimulation of holding fosters the alert state in the newborn), and odor. (After a few days the infant recognizes the mother's odor.) The child's suckling has been observed to have a calming effect on the mother, and exploring her baby's body is a rewarding activity for her. They observed a characteristic pattern of approach when mothers first touch their babies: they begin by touching lightly with the fingertips and gradually use more of the hand so that the palm contact increases steadily until they become comfortable with the full palm contact. This implies that frequency of palm versus finger touching may reflect important differences in maternal attitudes later, such as comfort with the baby, with caretaking tasks, or with the touch in itself. (Klaus & Kennell, 1983)

Their work illustrates the power of environmental factors. In a study done in Guatemala they found that mothers who had a supportive

companion during the birth and immediately afterwards touched their babies differently. There were dramatic medical benefits as well, such as a significant drop in nursing difficulties, labor times, and Caesarean sections. The amount of touching did not increase but the touching styles of the mothers with the companions differed from the other mothers. The accompanied mothers used more stroking, smiled more while touching, and in general, demonstrated more pleasure in touching their babies. (Klaus & Kennell, 1983)

Bowlby's work put the early mother-child relationship in a new perspective. He saw the infant's attachment behavior as part of a behavioral system involving control, regulation, feedback, and homeostasis in the relationship. The goal of attachment behavior was proximity to the mother. Aside from the obvious adaptive function of such behavior, studies indicated that increased contact, that is, proximity, was correlated with increased ability to cope with stress and frustration. "Secure attachment" was defined as a condition in which the infant explores the environment freely, using the mother as a base, without being upset unduly by the mother's absence or the presence of strangers.(1969, p.338) Secure attachment was fostered by (a) increased physical contact, (b) maternal sensitivity and responsivity to the infant's signals, (c) mutual enjoyment of mother and infant in one another, (d) the mother's facilitation of the infant's experiencing of consequences of behavior, and (e) reciprocity (Bowlby, 1969).

Bowlby found evidence that mothers' preferences for different holding patterns play a role in the evolution of attachment behavior pat-

terns during the first year. (Cf. Schaffer and Emerson, 1973, in section 8 of this chapter.) Face-to-face holding tended to occur during play, during the first year, facilitating visual engagement. Cradling in a ventro-ventral position elicited reflexes orienting the newborn to the mother and leading the infant to grasp the caregiver. The social aspect of the parent was experienced in a face-to-face mode, while the caretaking aspect of the parent was experienced differently. Most attachement behavior patterns involved touch, such as following, climbing, exploring the mother, face-burying, using the mother as a base, and clinging. (Bowlby, 1969)

Ainsworth et al's voluminous treatise on attachment touched on many developmental and theoretical issues. (1978) Based on observations of a large number of toddlers in a "strange" situation, they described three stable patterns of mother-infant interaction, which were categorized according to the quality of attachment observed. The key variable distinguishing the groups was the infant's use, or non-use of the mother as a "secure base" to explore the environment. They considered touch, not in itself, but as behavioral evidence of proximity-seeking, contact maintaining, resistance, or avoidance. Thus many different behaviors were resolved into evidence of one of the above "behavioral systems". (For example, clinging, clambering up, holding on, and crying in protest were all be seen as contact-maintaining.)

The mother's ways of handling their babies were seen as key indicators of the nature of the relationship. One group of children (group B) were described as "securely attached" relative to others. They combined interest in the environment with free expression of their needs to the

mother. They appeared unconflicted about close bodily contact with the mother. Their mothers appeared to be sensitive in their interventions and they had no aversion to physical contact. Children in group B found contact soothing and sought it when needed. They were assumed to have internalized the expectation of accessibility and responsibility on the mother's part. These mothers handled their infants with "tender, careful holding when in close bodily contact with the baby" (Ainsworth et al, 1978, p. 300).

"Anxiously Attached" babies--group C--were more anxious and harder to soothe. The threat of separation from mother was very anxiety-producing for them. They were relatively reluctant to explore the environment. Their mothers tended to be less responsive to crying and other signals. The mothers were not averse to contact; they were less sensitive than the group B mothers. Their holding of the babies involved little affection and was used primarily for routines. These babies often seemed in conflict about being held. For example, they might initiate a "pick-up" and then protest while being held, as if they wanted to escape.

Group A babies, like group C babies, were anxious, but they tended to avoid contact with the mother and explored the environment fairly freely. Thus they often appeared robust, friendly, and independent. However, they displayed their unexpressed anxiety in their avoidance of their mothers. Their explorations were interpreted as displacement behavior. Babies from this group showed heightened separation anxiety in their homes but in Ainsworth et al's "strange situation" they avoided their mothers to pursue their investigations of the environment. Their

mothers tended to rebuff infant initiatives for physical contact. They were interpreted to have suppressed anger towards their children and handled them relatively roughly. These babies were found to respond appropriately to physical contact from others, so they were presumably not discouraging their mothers. (Ainsworth et al, 1978)

Others have studied negative patterns of touch behavior. Biggar (1984) studied the persistence of maternal aversion to physical contact. She found that it persisted into the sixth year in a sample of mothers and their babies first observed when the children were 12-18 months of age. Maternal aversion to bodily contact was defined as rejection of the infant's efforts to initiate contact, facial expressions of distaste during contact, or pulling away from contact. A positive correlation was noted between maternal aversion to contact and rough handling of the infant by the mother. Biggar found that by the age of six, even a mutual ventral body orientation was avoided by both children and adults, illustrating the child's adaptation to the mother's style. Biggar found evidence that the aversion of the mothers in her sample placed the children in a behavioral "bind", in that the mothers rejection of contact was experienced as alarming by the children and thus became a stimulus to attachment behavior. In the course of following a sample of such children, first identified at three months of age, she found that by 9 -- 12 months the children manifested unusually high levels of anger and aggressive behavior toward their mothers. Thus, in this case, a maternal touching style appeared to produce an adaptation by the age-level being considered in the present study. For Ainsworth and Biggar, then, the mother's handling of the child is seen as a contributor

to the child's coping style and specifically to the child's selective interest in the environment and the use he or she makes of it.

Studies Dealing Directly with Touch

Observation suggests that there is great variety in the amount and the style of touching of infants by their mothers. Stephanie Day studied the various forms of sensory stimulation provided to a four-to-six-week-old infant over a two week period (1982). The relationship was a comfortable one. The mother had described her baby as calm, easily soothed, liking to be held, and sleeping a lot. The baby spent a great deal of time alone. (Approximately 13 hours a day) Feeding occupied 3 to 6 hours daily and was the most time- consuming social activity. The richest activity in terms of the number of sensory systems stimulated was social play, although feeding took more time. As for individual sensory modes, tactile stimulation appeared to predominate over other modes in terms of time. Day inferred from her sample that the infant received 6.7 hours daily of tactile stimulation, 2 hours daily of proprioceptive stimulation, and from 1 - 2 hours each day of visual, auditory, and vestibular stimulation.

An interesting comparison was made with the infant's older brother, then aged 3 and 1/2 years. In contrast to the baby observed, he had required rocking for soothing as an infant, because he had been "colicky". The observed baby was soothed by holding alone.

Schaffer and Emerson studied infants who are receptive to "cuddling" versus those who are not. Cuddling was defined as, "...that

form of physical contact where the baby is picked up, held with both arms in an upright position on the adult's lap, pressed against her shoulder and usually given some skin-to-skin contact such as kissing or cheek-stroking." (p.65) The age studied was the first eighteen months of life. The authors found that all the children sought contact, but that they differed significantly in their tolerance for restraint in contact. There was evidence that this difference was congenital rather than adaptive or learned; many mothers who preferred closer contact had non-cuddling infants. In additon the non-cuddling infants showed no sign of frustrated contact needs. The non-cuddlers tended to be more advanced in their motor development. (Schaffer and Emerson, 1973)

Thayer has reviewed the literature on the social aspects of touch. He found reports of sex differences in parental touching of infants. Mothers touch their girls more often than boys, and girl infants in turn touch their mothers more often than boys do. Mothers tend to be more free with physical affection than fathers. Fathers tend to be more physically affectionate with girls than with boys. When mothers hold their babies, it is usually for care-taking purposes, whereas fathers tend to hold their infants to play with them. (Thus habituation would be expected to be a factor in the child's response to the mother rather than in the response to the father.) Finally, touch has been observed to be a stressor on occasion, as in the case of a hyperactive child who could not abide touching. (Thayer, 1982)

Summary of Significant Aspects of Parental Touch

All the studies reviewed here seem to agree that modulation of stimuli by the mother to correspond to the normal infant's thresholds of response fosters development, either through increased learning about the environment, a more fruitful engagement with the caregiver, a heightened sense of security, and increased awareness or enjoyment of the boundaries of the self, or a heightened sense of control by the infant.

Touch is a significant mode through which this stimulus modulation occurs. The preceding studies suggest the following are major components of the infant's experience of being touched.

1. Level of engagement between mother and infant.

2. Role of touch in negotiation between mother and infant.

3. Role of touch in eliciting alert state or non-alert state in the infant.

4. Extent to which the effect of touch is pleasurable (as in stroking or soothing), or controlling, instrumental, neutral, or unpleasant.

5. Maternal ease in touching, as signified by frequency, duration, and presence or lack of conflict with the infant over holding, picking up, etc.

6. Parental sensitivity to the infant's thresholds for:

(a) physical pressure, (b) temperature, (c) haptic stimuli,-
(d) vestibular stimuli, (e) auditory stimuli, and
(f) visual stimuli.

7. Parental sensitivity to the infant's autonomy needs.

8. Parental Sensitivity to the infant's pacing and timing needs.

9. Parental preference for location touched, in terms of: (a) Extent of body touched, (b) Sensitivity (level of innervation) of preferred body areas, and (c) Distal-proximal preference by parent.

10. Caregiver's use of hand: palm vs. finger-tip touching.

This review indicates that although touch is of great importance in development, the study of touch in infancy requires further specification of the phenomenon and of the process. This study will use observational descriptions of of maternal touching in developing a classification and will propose data-based hypotheses regarding synchronous and dissynchronous aspects of touch interactions.

III. METHOD

Overview

This is a descriptive study using a hypothesis-generating method and using natural observations of a small group of mothers and infants in a social play situation. The goals of the study were: (a) to use these data to develop a data-based classification of maternal touching of the infants, (b) to apply the method to examine the temporal aspects of mother-infant interactions, that is, to extended touching events, and (c) to generate hypotheses about the occurence and significance of synchrony and dissynchrony aspects in touching events.

Subjects

The subject sample consisted of seven normally-developing mother-baby pairs. They were a racially mixed (white and Black) group. Four were male, three were female. Three were first born. The initial study was longitudinal over an academic year. The ages of the infants when they began to attend the nursery ranged from two to seven months. The mothers had volunteered to bring their children in response to newspaper articles about a psychological study of infant development. This study focussed on nine-month-old infants and their mothers, using data collected during the infants' tenth month of life.

The Setting

The study was done in the Infant-Toddler Observation Nursery in the

Child and Adolescent Division of the Department of Psychiatry, Downstate Medical Center, Brooklyn, New York[1]. The nursery consisted of a large living room area, with a smaller space to the side for diapering, naps, and mini-kitchen facilities. In the living room, there was a large play space containing couches, chairs, shelves with toys, and a slide. One or two observers sat on the sides of the room making notes or operating television cameras.

The mothers came to the nursery with their babies twice weekly for two-hour sessions in two groups, one of four and one of five baby-mother pairs. They were told to treat the situation as a their own time with no special constraints for the children or for one another. They were told that the goal of the study was to observe how babies develop. Free consultation was offered outside of the nursery time on any concerns which they had about their babies or about parenting.

During the nursery sessions many activities took place. There were extensive conversations among the mothers especially regarding their babies and their experiences of pregnancy, birth, and motherhood. They played with their own and one another's children. They "baby-sat" occasionally when one had to leave room, or watched and listened to the activity. There were frequent mixed activities such as simultaneous play with the child and conversation with other mothers. A good deal of time was spent in caretaking activities. Touching was frequent. (See table 1 for an overview of the time spent touching.)

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Ruth C. Resch, Ph.D., Director of the Infant-Toddler Observational nursery.

The Data: Collection and Sampling

Videotaped samples were made of each two-hour session. Three cameras were set up on tripods on the periphery of the play room, two manually operated and one remote-controlled. Event samples were made of mother and baby, with the primary focus on the baby. Events sampled were: play, play in proximity to the mother, and movement by mother or baby toward or away from the other. In addition, a random sample of 10 minutes was made for each mother-baby pair once a month.
The videotaped segments were recopied and consecutively compiled by subject as individual subject tapes for study.

The entire group of observations for the nine-month-old babies was reviewed and all incidents of touching were flagged for analysis. The data for this study was the first half of the total of all touching events observed during this period -- the tenth month of life -- for each mother-infant pair. A touching event was defined as any continuous episode of touching of mother or baby by the other.

Diapering and dressing were been excluded from the sample because only some of the mothers used the play area for this purpose. Others used the diapering area, which was not in clear view for video observation. Thus the sampling for these activities was not random. Occasional adjustment of clothing during play and feeding during play were recurring activities in the play-space. They were included in the data.

Data Analysis

This study used a hypothesis-generating model described by Resch (1976) for the study of naturalistic observation. This method is used to develop systematic data-based descriptive classifications and/or hypotheses, as systematic preparation for hypothesis-testing procedures. The method of analysis is as follows: A sequence of behavior is observed and recorded. The recorded events - in this case, videotaped observations supplemented by written narratives of the same events - are reviewed repeatedly until organized patterns of behavior emerge. The pattern or patterns may be descriptions of behavioral units, observations of sequences of behaviors, or observations of changes in sequences. The initial patterns derived from this data base are then repeatedly reformulated and reapplied to the sample in a successive process of better and better fitting approximation.

Resch has called this data analysis a "propaedeutic analysis", that is, "a preliminary and systematic search in the natural phenomena for the ... relevant variables ..." (1976, p. 178). The criteria used in this process for judging the validity of the constructs are statistical principles, applied in a substatistical way. These criteria are: <u>frequency</u>, accounted for by noting recurrence of behaviors; <u>variability</u>, accounted for by observation of changes in or nonappearance of behaviors; <u>validity</u>, assessed by the observed fit between the behavior and hypothesis; <u>reliability</u>, achieved through the use of multiple judges (not used in the study), and <u>probability</u>, which is assessed in terms of the frequency of appearance of a behavior or pattern relative to the

sample size. These criteria are used to evaluate and reevaluate the observed patterns in order to obtain the "best fit" with the data.

The N of touching events for all seven mother-baby pairs was treated as a single universe of touch events. The behaviour was no studied in a comparative way, and therefore was not examined by subject. The primary researcher was the only judge. The goal was not to rate behavior individually along specific dimensions but to systematically describe the observable aspects of maternal touch.

The Observations and Narratives

Detailed written narratives were made by going through the video samples repeatedly . An observation format was then developed, consisting of a list of aspects of touching. This format was used throughout to ensure uniformity among the written narratives and observations. An outline of this observation format can be found in appendix C.

Touch is defined as physical contact between individuals such that one impinges on the other's body boundary sufficiently to produce awareness of contact in one or both parties through either tactile or deep pressure sensation, vestibular, or kinesthetic sensation. While temperature is part of the sensory experience of touch it is not behaviorally observable in this study. Painful touching was seen only once in this study.

Touch events were subdivided into natural segments demarcated by changes in posture, position, behavioral context, form of holding or touching, affect, or attention. These were accounted for in the observa-

tion format categories. One objective of the study was to develop an operational specification of units of touch behavior.

Preliminary Directions of the Study

Preliminary work on this study suggested that mother and infant were frequently in a paradoxical relationship of general cooperation, in which there was also disruption and misreading of cues. Thus the objective of the data analysis was to develop a touch classification describing the relational variable of synchrony-dissynchrony.

From the preliminary work , synchrony, as described from these data, was said to occur when the mother - or child - facilitated the other's engagement with environment, self, or other, in such a way that the flow of attention and withdrawal was only minimally disrupted. This was seen in shared attention to a task or an object, shared interest, successful soothing, mother facilitating child's interest through postural support, child or mother allowing the other to handle his or her body, or visual engagement. Synchrony of these kinds was observed on the momentary level and depended on the mother's awareness of the infant's shifts in needs, interests, and states. Synchrony existed on another level: that is, an interaction could be "synchronous" with respect to overall behavioral goals, as in the case of a mother getting a toy or food for the child. Thus the synchrony level of an interaction, as the word is used here, is not simultaneity of events; rather,it is a summation of the extent to which both partners in an interaction join one another or cooperate in an activity.

Similarly, dissynchrony was described and defined as occuring when mother and child were at cross-purposes, or when distress occured, or when mother or child attempted unsuccessfully to cooperate. For example, an infant might gesture to be picked up while the mother holds it at a distance. The infant might be twisting away while the mother holds the child closely. A mother might try to soothe the infant without success, or try to direct the infant's attention to something while the infant remained engaged elsewhere. Again, dissynchrony appeared on the overall and the momentary levels. These definitions were starting formulations for the final phase of the data analysis -- the task of developing a data-based classification of synchronous and dissynchronous touch interactions.

IV. RESULTS OF THE STUDY

Introduction to the Data

Mother-infant interactions were observed in which touching was a medium of communication, ranging from conflicted to harmonious exchanges. The major observation resulting from this study is that, during touching, synchrony and dissynchrony are not mutually exclusive opposites on a behavioral continuum. Rather they are both in evidence during periods of general cooperation and may even occur simultaneously. During intervals of general cooperation there can be many disruptions and dissynchronous events that are often resolved in such a way that cooperation is maintained.

For example, in one event (Ann: X,vi,1) Ann reaches for another child's bottle while her mother restrains her. They are in conflict with respect to the child's wanting the bottle. However the mother is holding the child in a way that is synchronous with respect to body movement and touch communication. In other words, she holds Ann lightly around the waist in a lightly enclosing way without pulling her away. Her movements are deliberate, so that the child absorbs the message with a minimum of disruption and frustration.

Similarly, in another event, Lea (VIII,iv,1) is toddling toward her bottle with the support of her mother, who holds Lea by one hand. The mother picks up the bottle and Lea in one sweeping motion and deposits Lea on her back on the rug in front of her with the bottle in her mouth. Thus the interaction is harmonious with respect to the overall goal of

feeding but is briefly dissynchronous with respect to the mother's touching of Lea. (Lea stiffens and looks worried as she is swept through the air.) Other examples were seen in which touch appeared to convey mixed or contradictory messages.

The temporal character of these touch synchronies and dissynchronies is the second major observation of this study. There was sometimes enormous variability from moment to moment, while at other times there was little change. The highest levels of synchrony were momentary, even in the most active and generally harmonious pairs. Dissynchrony appeared during higher levels of physical activity in the relationship. Paradoxically, high levels of engagement and of synchronous behavior appeared during touch interactions which were characterized by ongoing moderate levels of dissynchrony. To sum up, then, peaks of synchrony were brief. The highest levels of harmony or synchrony tended to occur in mildly conflictual contexts. In fact it is difficult to find an event in the data which does not contain wide changes in levels of conflict and agreement. (Only very short touch interactions can be neatly characterized.)

An ordinal scale of touching interactions will be presented, in which touching events are ranked according to the synchronousness of the partners' behaviors, that is, in order of the extent to which the partners each join with the other in some form of shared activity, shared attention or interest, general cooperation, or interpersonal engagement. Narrative examples are given from the videotaped data, followed by narrative analyses. These examples are representative of the data. The extended touch events will be discussed primarily in terms of

the changes in synchrony and dissynchrony during touching.

The following terms will be used in the narrative analyses of the videotaped observations:

1. Complementary Action is behavior by which mother or infant "joins" the other, that is, behavior by which one facilitates or cooperates with the other. Complementary action is non-disruptive.

2. Consultation refers to the mother's advertising of her presence or her intentions to the infant through a deliberate, preliminary touch. It is a form of touch intended to convey a specific message. For example, a mother intending to pick up her infant may touch him first in a lightly enclosing way on the shoulders in a way that elicits the infant's visual attention and gives the mother an opportunity to assess his state.

3. Engagement is used in the sense given it by Beebe and Stern - "a composite of a number of criteria of relatedness". (1977, p. 37) In essence, the spectrum of engagement - disengagement describes the level of awareness of, interaction with, and enjoyment of mother and infant by one another. Consideration is also given to non-visual manifestations of engagement and to the high level of awareness of the other which is implicit in any conflictual exchange.

4. Hovering is a form of pre- or post-touching behavior in which the mother's hand is poised to touch the infant more intensely, or to move away. It is a conditional gesture on the mother's part during which she is undecided whether to engage or to disengage.

5. Intimacy of touch: This is an observational assessment based on the locations touched on child's body, and the extent of the child's or the mother's body which tends to be touched. Sometimes mothers touched and caressed their babies' heads, hands, faces, and buttocks. At other times they preferred briefer or more perfunctory touching of sensitive body-parts, and more use of a finger-grasp or grasp of clothing, as opposed to a full,open-palm grasp of the child's body or limbs.

6. Negotiation refers to a bargaining process observed in this data in which mother and child begin with somewhat contradictory purposes and after a period of nudging one another in the preferred directions, finally compromise on some mutually acceptable activity.

7. Pacing refers to the characteristic speed of the mother's movements in touching her child over a period of time.

8. Proximity of Touch refers to proximity vs. distance. This category describes the extent to which the child is touched with a full or open grasp and the extent to which free contact occurs between the bodies of mother and baby. Holding an infant by grabbing its overalls or by picking the baby up with one's forearms are forms of relatively distant touch. ("distal" touch.) Holding the baby with an open-palm grasp of the baby's body is a more proximate one.

9. Synchronous behavior refers to an interaction in which mothers' and infants' behaviors are approximately simultaneous, or complementary, or non-disruptive. During a synchronous condition, mother and infant are engaged in sharing attention or interest, joining in an activity, cooperating or facilitating each other, or in a state of visual engage-

ment. Thus "synchronous" aspects of an interchange can refer to periods of a fraction of a second or several minutes.

Dissynchronous behavior is said to occur when mother or child disrupts the other's attentional focus, fails to join the other in a complementary way, or inflicts distress on the other.

10. Swaddling refers to holding the infant in a firm, highly enclosed way, so that the child's movements are severely limited.

11. Timing refers to the mother's matching of the occurence of transitions in touching to the infant's readiness for or receptivity to the transition. It refers, in effect, to the schedule of delivery of the mother's touches. Touch which is well-timed is not only moderately disruptive to the infant's attention or state-management.

Classification of Examples of Maternal Touching with Respect to Synchrony and Dissynchrony

The synchronous and dissynchronous aspects of touch interactions fluctuate, sometimes rapidly. The following events were selected as representative of different levels of synchronousness during touching. The first two are seen as essentially dissynchronous. In examples 4,5, & 6, one of the two partners in the dyad is actively seeking a more synchronous interaction. In the last three, synchrony is sought by both. (Example 3, being essentially neutral, was seen as an example of a lack of synchrony.)

1. Instrumental Touch, Mother and Infant at Cross Purposes.

Tom: I, iii, 8 — Observation 1

> Tom is sitting on the floor in front of mother mouthing a toy. He starts to crawl away. She pulls him back by the waist of his pants to a sitting position in front of her. He kicks and scowls but remains sitting in front of mother for a few seconds. (5")

In this example, Tom and his mother are at cross-purposes. (From the preceding observations it is clear that Tom is attempting to reach a pile of toys in front of him, and his mother has restrained him a few times in the preceding minutes.) She uses touch in a purely instrumental way here, touching him in a limiting way. Her touch is distal rather than proximate, relying on a finger grasp of his clothing to restrict his ability to move in space with minimal limiting of his ability to move his limbs. His back is to her, precluding visual engagement. He

expresses frustration while she's restraining him. She initiates and terminates the interaction. Her attention is all on Tom; his is divided between his scanning of the room, his experience of being pulled back, and his experience of mouthing the toy. The duration of the conflict and of the touch is brief. (It should be noted that other such events occurred involving Tom and Ned, who usually displayed no affective reaction to being pulled about but either tried to move back or became engaged in some new activity. Thus his scowling is not an inevitable response to this "sack-of-potatoes" treatment.) His anger may be a reaction to being thwarted or it may be a reaction to her handling of him. The former seems likely in view of his tolerance for brusque handling. In this example we see highly instrumental touching carried out in a relatively distant way, with no clear attempt by the mother to engage Tom's cooperation.

2. Instrumental Touch in Moderately Dissynchronous Interactions. In this kind of situation, either mother or infant interfere with the other; or, one of them is unable to join the other in a complementary way. Overt negative affect or conflict in purpose is not seen (as seen in example 1.). It is often accompanied by a negative affective tone.

Ned: X, ii, 1 & 2 Observation 2.

> 1. Ned crawls to mother on all fours. He touches her left foot with his right hand and stretches out his left hand to her. (She is on the couch.) He seems to be gesturing that he wants to be picked up. He slips down. She does not respond. He reaches for toy, and picks it up and mouths it, turning to look at the room.
>
> Ned puts the toy down and tries again to raise himself. He falls forward toward his

mother. She reaches to move aside a box in his path and extends her arm to support him. Ned raises himself, grasping her pants leg for support. His left hand is above the camera's view -- it looks like she is helping Ned by holding his left hand up.

Ned stands facing her with a hand on her leg. He becomes interested in something in Lea's hand and turns to his left to see it. Then he sees a bottle held by a third infant to his right. He sits down on the rug and reaches for it. Lea reaches over and pulls Ned's hair. His mother pulls him back slightly by tugging on his overall strap from the rear.

Ned holds the third child's leg, staring at the bottle. (42")

2. Finally his mother pulls him back, grasping him under the shoulders and seating him by her left foot. As she moves him, Ned sticks his right thumb in mouth. She drops a toy in front of him -- the one he'd been mouthing originally. Ned has a wistful look. (1")

Ned approaches his mother seeking contact. She appears not to respond although he is falling on her legs. He finds an alternative activity - mouthing a toy. As he persists in approaching her and trying to raise himself, she becomes more responsive - supporting him with her right hand as he stands facing her. He is content with this level of response. His mother allows him to separate and reach for the other child's bottle, then she opposes him by pulling him slightly back (from the rear). Ned tries to maintain his involvement with the bottle by holding on to the child and staring at the bottle. Then she pulls him away and he consoles himself (my inference) by putting his thumb in his mouth. Here, Ned's mother uses touch at a distance and then in a relatively non-intimate way: she briefly holds him by the hand, then tugs

him, holds him and tugs him by his overall strap. He and his mother do not appear to engage visually although she is clearly monitoring his movements. His affective tone is glum; hers is solemn. Ned and his mother are in dissynchrony in the beginning when he is trying to get her to pick him up, and again at the end, in the sense that she frustrates him. It is also true that Ned accepts her level of response and that therefore they are in synchrony to some degree. The interaction involves a negotiating process. For example, Ned, by falling forward toward his mother, demands to be helped up, His mother responds minimally at first, and finally compromises by giving limited assistance. As in the first example, the role of touch in this exchange is primarily instrumental. Here, however, the touching is less abrupt. She supports his standing up at first, then she allows him to move away, and then she pulls him back to be next to her. Ned's mother "consults" briefly by tugging lightly before pulling Ned back. He responds by remaining fixated visually and posturally on the bottle. She responds with a tug backwards. Thus touch plays a specific communicative role during part of this exchange.

3. Passive Contact:

Touching occurs with no other perceptible accompanying interaction. For example, children sometimes lean on their mothers without eliciting a perceptible response. Or, mother and child are sometimes seen sitting quietly with child in mother's lap with no apparent intent to move or clear attentional focus on either's part. Or, mother may touch her child without apparent response.

Ned: X, iv, 3 Observation 3.

> Mother is sitting in chair chewing gum. Ned sits in her lap facing room. She has just put on his coat. He looks intently at something in the room.
>
> His mother sits back in the chair. She folds Ned's legs in between hers and pulls him back to lie on top of her as she lies back in the chair. Her hands lie over his groin area. He puts his left thumb in his mouth. His expression is solemn. She clasps her fingers on top of Ned. Both are still, expressionless. Ned rests his hands on top of her arms. He taps her left arm. (approx. 20")

In this example, the pair are somewhat synchronous, but only in a passive way. The initiative for the contact comes from the mother. She holds Ned in a very enclosing and controlling way, with a maximum of body contact between the two. Ned adjusts by becoming passive physically. The back-to-front position minimizes the "intimacy" which is fostered at the same time by the body-to-body contact and by her touching of a sensitive area - Ned's groin. (No visual engagement is possible in this position.) Mother's attention appears unfocussed, almost glum. Ned sucks a thumb; whether as a diversion, a substitution, a way of focussing his own attention, or a way of screening out stimuli, we do not know. Touch is used to control and enclose Ned, although it is not clear why this is done. (In actuality, this event is a pause in dressing for departure.) This exchange is warm and intimate in one sense, offering high body heat and extensive body contact, and impersonal and controlling in another sense -- there is a minimum of negotiation and no visual engagement.

4. Instrumental Touch / Accommodation

In these events, one partner initiates touching while the other adjusts or accommodates. For example, an infant may be in the mother's lap trying to look over her shoulder, while the mother accommodates herself posturally but does not react otherwise. Or the child may accept being moved, cleaned, or picked up without further objection or response.

Lea: IX, 1, 3. Observation 4.

> This time we can see mother's hands but not her face.
>
> Lea is on the floor in front of mother. She touches mother's left leg with her RH. Then Lea grabs mother's LH and pulls herself up to stand facing the couch, facing mother. Mother's LH doesn't move in spite of Lea's weight. (5" altogether)

Here touch is used to support in the sense of assisting Lea. Mother and child are face-to-face - but we can't see their faces. Contact is made made with the hands. The mother's LH is open and available to touch but does not touch actively. Mother offers her body passively for physical support. The contact is distal.

This is an example of accommodation on the mother's side - the child initiates, the mother accepts and accommodates. For a few moments, the mother is unresponsive. Lea persists and elicits the mother's support. A balancing act follows; each must adjust posture and position until Lea is standing. Thus there are interlocking cues, expectations, and adjustments. The affective component is not clear. Both are highly aware of each other, presumably, since this is required to execute the maneuver.

The reverse was often seen as well, with the mother impinging on the child through touch and the child accepting and accommodating physically, as in the case of a mother picking up the child or adjusting the child's posture.

5. Touch in a Dissynchronous Interaction with a Mixed Affective Tone.

Here mother and infant express opposing feelings and purposes in a shared activity.

Tom: I, iii, 10b Observation 5.

> Mother and Tom are seated on the floor, facing on another. (Prior to this event, she had just given him a "noisy" toy and they had had a brief visual and verbal interaction with him about it.) She leans toward him, enclosing his head with her left hand, and kisses him on the forehead, while her hand slides down the right side of his head with a lingering, stroking movement. (We cannot see her right arm or right hand.) As she kisses him, Tom ducks his head, and displays a worried look. She sits up, with her hands lingering on his chest and back, and Tom turns toward the camera with a worried, slightly scowling look, mouthing the toy.

The touching is brief (1 or 2 seconds). The mother's agenda is apparently to express affection. Tom tries to withdraw from the kiss. She holds him in a limiting way, touching a highly sensitive area in a face-to-face position. (Tom averts his gaze.) She uses her open palm to touch his face and back in a lingering way, savoring the contact. His reaction is to be wary. It is not clear why. Tom's mother controls the initiation and termination of touching. Her attention is fully on Tom;

his is divided. He may be using the toy in the mouth as some kind of alternative engagement. Touch is used here to express affection in a physically controlling way. Tom tries to disengage by ducking his head and scowling slightly. (This also illustrates the fact that affection and synchrony are not necessarily related.)

6. Touch in a Dyssynchronous Interaction with a Positive Affective Tone.

Ken: XV, vi, 2. Observation 6.

> Mother has just finished dressing Ken for departure. She leaves him lying on the rug. She returns and leans over him, standing up. She reaches down, holds his tummy with her open hand, and rocks Ken quickly back and forth. Then she lets go and stands up. Ken waggles his legs in response.
> (Touch-time: 1")

This opens with an example of the "open time" of which Sander speaks (1983). Ken's mother then grabs his attention with a brief affectionate shake. She holds him in a highly controlling way in a face-to-face position. (We cannot see if visual engagement occurs or not.) Although he is left free to move his limbs he is briefly but massively controlled in that he on his back looking up, while she holds his ventral area - a sensitive area - with her open, out-spread hand, and shakes his entire body with a vigorous motion of her hand and arm. Although the affective interaction is not clear, his response appears to be one of enjoyment, judging by the comfortable tone of his leg movements. On the whole, her touching of Ken is invasive but apparently

pleasurable to Ken. This is reminiscent of Stern's description of the tickling of a three-month old as a form of playing at the boundaries of the infant's sensory thresholds (1977).

7. Negotiation, Positive Affective Tone.

In this brief encounter, mother and infant are active and highly aware of each other. Mother and child try to influence one another in a variety of ways. They are not fully in harmony. The affective tone is positive on the whole. Touch plays a major role in communication during the negotiation. Although the first 10" of this event are rather dissynchronous, once the mother's soothing begins to take effect it is a busy but essentially synchronous interaction.

Lea: IX, i, 1. Observation 7.

> With mother sitting on the couch, Lea plays on the rug with Ken. Mother is smoking a cigarette and talking to another mother. Lea crawls toward her and climbs up to stand supported by the couch facing her mother. She stands between her mother's legs with her arms resting on her mother's thighs. Mother leans back and puts out her cigarette, blowing smoke away. She sits for a moment with a slightly exasperated expression on her face.
>
> Then mother leans forward and picks Lea up, holding her below the shoulders with both hands. She brushes Lea's face with hers. Then she stands Lea on her thigh, facing her. We cannot see Lea's expression; she is apparently distressed, because mother says, "What's the matter?" and other such things in soothing tones, smiling. Lea restlessly bounces up and down as mother holds her. Finally after about 10" have passed, Lea lies down on mother's chest with her head looking over mother's left shoulder. Mother hugs Lea with her right hand

around the back of her thighs and her left hand on her back. Then mother pats her. Lea sits back to face mother and bounces in this position. Her mother changes her holding of Lea so that she supports her with the left hand around Lea's thighs and her right hand on Lea's hip. Mother smiles and says something soft to Lea. Lea looks happy. She mouths a toy - a plastic ring with things to chew. Mother continues speaking to Lea -can't make it out. Then mother becomes serious in her expression.

Something to the right catches Lea's eye. She starts slowly leaning that way and mother lets her slowly slide off her lap onto the couch. It looks like a slow-motion dive as Lea works her way down and to the right. Her mother keeps a sliding hold on her leg and eventually her feet. Finally the mother's hands are off camera. Lea's movements are not impeded. Mother converses with someone else. 41")

It is not clear what Lea wants, other than contact with mother, to initiate this touch encounter. Evidently she requires some mild soothing. Mother supports her to comfort her after pausing for a few moments. Then there is an interval of patting, hugging, and visual exchange - soothing becomes play. When mother becomes serious, Lea becomes interested in something else at the same time - it is not clear if these events are related. They disengage smoothly.

Mother holds Lea in a restrictive, enclosing fashion but in a way that is appropriate and acceptable to Lea. In addition, her way of holding (under the thigh) gives Lea maximum freedom of movement within the context of being held closely - Lea can lean forward or backward. Mother uses a full open-palm grasp around waist, chest, and thighs. Mother and Lea move in and out of full visual engagement in a face-to-face position.

Affect: Initially, Lea is seeking to be picked up while mother looks a bit reluctant. As mother tries hard to soothe her, Lea appears restless, by her movements (we cannot see her face). Mother tries to cheer Lea up and Lea does appear to be won over - she smiles. Then Lea shows interest elsewhere, after mother's affect becomes solemn.

Attention: Mother is very focused on soothing Lea. Lea has engaged her mother's attention. Lea, in contrast, is restless. Finally mother engages Lea's attention in play together. Following that, the mother's loss of interest and Lea's change of interest seem to coincide, as they separate, although mother's change to a solemn expression actually appears first.

Self-stimulation: Lea turns out to have been holding something in her mouth throughout. It may be some kind of stimulus management or self-consolation.

Synchrony: Unlike some of the other examples in which the level of synchronous behavior fluctuates greatly, this interaction consists of a gradual working toward a high level of cooperation, awareness, and enjoyment of each other followed by a rapid but evenly - modulated progress to separation. At first Lea almost forces herself on her mother who withdraws slightly, postponing her response, before she responds and comes to Lea's aid by picking her up. Then the mother engages Lea in a soothing, playful interaction, using touch (of faces), vocalizations, and visual exchange. Lea becomes engaged in this, but only after a while. At first she is restless, although not greatly so. Then she is

passive, flopping on mother's shoulder. Thus mother and child are not fully cooperative at this stage.

Perhaps responding to mother's hugs and pats, Lea then sits up and she and mother then engage in a playful, affectionate exchange. She is bouncing in mother's arms, precluding intense visual engagement but expressing pleasure and/or excitement. Lea and mother appear to have achieved a high level of cooperation and engagement during this exchange. It is not a smooth meshing of movements and other behaviors, but rather is an affectively positive interaction characterized by continual adjustments and accommodations in posture or position, movement, touch, and gaze.

When Lea gets interested in something else, mother lets her gradually disconnect physically, controlling her in a very subtle way so that Lea's physical autonomy is not restricted but mother remains highly in control. (She lets Lea "slide" away.) Somehow her handling of Lea expresses both sheltering and letting go at the same time.

The role of touch: In the beginning, Lea uses touch to demand closer contact from her mother. Her mother uses touch in response to bring Lea close and support her in a position in which both can indulge in various levels of engagement. In this position, also, she can use several techniques, including facial touch, to comfort Lea. After hugging and patting Lea, mother then holds her in such a way as to allow Lea to bounce up and down and manipulate a toy. Finally, mother's touching and holding of Lea allows her to "slide" away while preserving mother's control.

Thus touch is used for support of Lea, for some affectionate gesturing, and finally, for constraining Lea's movements, which is somewhat intrusive for Lea. She extricates herself gradually. The mother's touching of Lea maintains an active sense of connection throughout the negotiation.

8. Joining

This type of touch-interaction involves a high level of cooperation between mother and infant. Ex.: an affectionate exchange of glances reflecting a moment of high interpersonal engagement; or, mother and infant play with a toy without disruption of either one's attention; or, mother soothes infant and infant responds readily.

Piq: VIII, i, 3 Observation 8.

> With mother sitting on rug holding cup of coffee LH, Piq crawls to mother. He pounds on her right thigh with zweiback in his hand. She makes an enclosing gesture with her right arm touching Piq's head, opening a space under her arm. He crawls onto her leg. Finally she puts her coffee down. She picks up Piq under her arms. She holds him in upright position facing her, keeping the distance. Not clear if he is standing on her thigh. They smile at one another -- she has a big smile. He waves and points to something. She pets him. They are still facing.
>
> She lifts Piq onto her lap and seats him, facing out on her thigh. Piq nestles briefly. Then she moves him so that he is standing next to her, leaning on her. Piq hugs her, and then scans room while embracing her. She keeps an arm (L?) around Piq. He's still scanning.
>
> Throughout this process she is carrying on a conversation with someone off camera. Camera leaves Piq and mother.
>
> Camera returns briefly to Piq -- he has been

> put down on the rug next to mother. We see her hand pulling back gently. All the children look at Dr. Resch, who has just entered.

Again we do not see the highest levels of working together until after some "negotiation" has taken place regarding Piq's apparent demand for close contact. After putting him "on hold" briefly with a limited response - giving him room to get on her lap and touching his head - she evidently decides to respond more fully and holds him face-to-face under the arms, a controlling way to hold him. This allows, first, for an interlude of high engagement, and then, a brief sharing of the experience of looking at something off the screen. Then she moves him into a less visually engaged but close-contact, enclosing and controlling position (nestling in her lap), with her arm around his back. They are still joined in nestling and scanning the room, combining an exploratory task (scanning) with a dependent posture (nestling). She moves him again to a position which is still highly enclosed (leaning) but which is also more independent, in spite of the massive touch-contact involved in leaning, in the sense that he can turn and move easily.

Her attention is divided: she is chatting throughout with someone offscreen. She smiles often at Piq and is apparently enjoying their encounter. Piq looks a little wary and his movements seem a little urgent to this observer, suggesting that he is experiencing mild concern of some kind. He initiates the encounter and the touching in particular. She is fully in charge after that.

Touch is used in many ways in this event: First, as a gesture of demand (Piq) and a gesture of recognition and joining (mother's strok-

ing, and later, patting). Then it is used to support Piq and facilitate an interlude of visual, vocal, and touch engagement (patting). Then it is used for a combination of support and expressions of affection (nestling, hugging) as the mother gently moves Piq into postures which are less visually engaged but high in body contact and enclosing and controlling of the infant, culminating finally in separation. Touch is often used to stay "in touch" or to keep Piq "on hold" - that is, an intermediate state between separation and full engagement. She does this especially when her attention is divided between Piq and whomever she is chatting with. This semi-attentive state was commonly observed in the data and touch often played a role similar to the one just described - maintaining contact and giving recognition while postponing fuller engagement.

The highest level of cooperation and joining is brief. After a few seconds, the mother moves Piq into a position which is physically closer and more intimate in a way (nestling) but less engaged visually and less demanding of her psychologically then the face-to-face interaction. He accepts her various changes in his position and in her way of holding and touching. She moves expeditiously, without visible "consultation", (see definitions, p. 52) which may account for his slight expression of wariness: he may not have quite enough time to process the movement.

9. Close Cooperation

Close cooperation, or "meshed" behavior, is acting in unison so that each facilitates the other.

Ann: XVI, vi, 3e Observation 9.

> Mother picks up Ann under the shoulders, moving slowly, holds Ann to her breast with Ann's face over her shoulder. Her movements feel careful and deliberate to this observer. Ann smoothly folds her legs up into a sitting position as Mother places her arm under her buttocks. (Simultaneous complementary movement by Ann and mother.) Mother leans forward, turning, pats Ann gently on the back while doing so. "I'll be right back" seems to be the message of the pats. Camera swings off Ann and Mother, back one moment later: Ann is now crying on the couch, seated alone, Mother has crossed room to get food.

Note: The patting looks "gentle" in that the Mother's hands rest on Ann's back while fingers move slowly up and down. The steady pressure feels soothing (to watch) and the varied pressure similarly feels alerting. The combination of steady and alerting touch may lead to the calming effect.

This event comes at the end of a minute-long interaction in which mother has been trying various positions in her lap for Ann without Ann's getting comfortable. In spite of Ann's restlessness and the increasing dissynchrony there are several moments of effective soothing and expression of tenderness on the mother's part.

In this segment soothing Anne is the primary goal for the mother. Highly synchronous behavior is observed at the moment when mother picks up Ann and puts her to her shoulder, while Ann simultaneously folds her legs up underneath her so that her mother's arm can fit to support her bottom. This is a momentary, simultaneous, complementary movement by both Ann and mother, as well as coordinated as any ballet. This appears

to be an example of a "shared behavior pattern" rather than a stimulus-response sequence (Stern, 1977). Ann's unsatisfied state, however indicates that dissynchrony is also present. As Ann's mother leaves her to get food, her distress re-emerges (dissynchrony), but her leaving Ann on the couch is in harmony in a general way with respect to Ann's hunger.

Here the mother's touch involves holding very closely in a controlling way, with full support, for purposes of soothing Ann with extensive body contact. Almost immediately, however, mother puts Ann down, using touch to signal that she remains in contact (patting). The mother takes the initiative in all forms of touching seem here. Both appear completely absorbed: the mother in trying to figure out what Ann wants, and Ann is absorbed in her own state. Interestingly, for all her distress, Ann does not self-quiet with thumb-sucking, etc. For an interesting contrast, see the end of observation 14. In that case a shared behavior pattern becomes a pattern of conflict as the mother tries to pick up Ann and Ann thwarts her with her movements.

Extended Touch Events;

Applications of the Classification

The following events exemplify more extended touch encounters. In this section I will describe and then analyse them in order to examine how synchrony and dissynchrony change in the course of touching interactions.

Tom: I, ii, 3a and 3b Observation 10 (108")

3a: Tom in playroom sitting on rug. Mother has just moved him away from a baby he's been very persistently trying to pat.	Instrumental (Cross-Purposes)
a. Tom looks over left shoulder at mother as she walks up to him with Pat the Bunny. She says, "Here's a book" in hurried tones. Tom looks at the book with great interest indicated by visual focus and postural change. She sits next to Tom on his left and holds the book with her left hand, pointing to it with right hand. Then she moves it more comfortably into his field of vision. Tom feels a page (left hand). Mother then takes Tom's left hand with her right hand and makes him turn the page. Then she lets go. He feels book (page) again. Her hand hovers over his -- starts to take his hand (wrist?) several times and stops before doing so.	Joining as to exploring book; Negotiation as to position, posture, pace, etc.
Tom lifts his hand from the page briefly, then touches the page again. Mother takes his hand again. Then she lets go.	
Tom tries to turn the page backward. She holds his wrist so that he can't. He snatches his hand away.	Dissynchrony, Mixed Affective Tone.
He resumes touching the page. Mother flips something on it, trying to engage his interest. She says something (indistinguishable).	
A long, low, honking sound is heard from outside. After about 1 sec. Tom looks up and scans room, presumably looking for the sound.	
3b. Tom looks back up to her, worried, and climbs up in her lap with arm outstretched. He vocalizes an indistinct sound of mild anxiety.	Negotiation, leading to Joining.

Mother lifts Tom awkwardly with her forearms under his shoulders (she's still holding Pat the Bunny).	
She sits him on her right thigh with his legs between hers. Her right arm rests in an enclosing grip around his middle, right hand resting on Tom's stomach.	Joining as to physical support. (right side)
Mother resumes reading the book. Tom looks very interested (visual attention). He starts to poke at the page again, with his left hand. She interrupts verbally - can't make out what she says. He looks up to her with his hand suspended above page.	Ongoing negotiation as to posture, etc. and use of book.
She pulls the book up to her face and pokes her face with it -- not clear if she's sniffing or not. She looks at him as if to say, "You try it." Then she pokes the book in his face before he can act. He's grinning as she pulls the book away. She pokes it in his face again. A mildly distressed sound is heard, possibly from Tom.	Dissynchrony, Positive Affective Tone.
Tom looks somewhat alarmed. (Presumably he is conflicted between pleasure (teasing?) and aversion.) Then he grabs the book with right hand with a (slight) scowl of concentration, tries to turn it. Mother holds on to the other side of it with her left hand. He moves it up and down. It flies off to his right. Mother leans over to pick up the book, holding him around the middle. Unclear vocalization (by Tom?) during all this -- sound of mild effort.	Same, Mixed Affective Tone
Mother holds book up to read again. He's smiling as he looks at it. Then he looks up at her and they grin spontaneously and joyfully at each other. He looks back to the book. She turns page. Tom (?) makes an indistinct sound -- perhaps trying to name the thing on the page. She says something -- presumably the name -- in a pleasant tone.	Negotiation.
Tom's mother takes his right hand in hers to pat the page. Tom (?) makes a sound suggesting aversion and pulls his hand away. After asking, "That hurt?", she does it again. She lets go and he feels the page. Mother makes encouraging sound. He turns the page.	Joining (Peak)
Mother promptly turns the page back. He writhes backwards, twisting, making a sound of protest. She holds on to him and sits him astride her thigh. (She is still holding Tom around the middle, holding the book in her left hand, as if to read it.) He looks at it glumly. Mother has slightly exasperated expression on her face. Someone off camera speaks to her and she converses with them.	Negotiation Dissynchrony, Mixed Affective Tone. Negotiation

Tom looks worried and she looks sad. He starts writhing backwards again. Finally she sets him down -- somewhat roughly -- he looks slightly alarmed -- then he moves away, goes to book, puts it in his mouth, and continues to play with it alone, while sitting in front of her. Mother continues to converse with person off camera. We hear straining sounds (from Tom or younger baby?).	Dissynchrony, Mixed Affective Tone
Tom continues to play with book: sliding it, picking up and dragging. Mother sits immobile, talking. Tom crawls off to slide -- she watches. (108")	Negotiation

Narrative Analysis: 3a

Tom's mother is trying to engage Tom's interest in the touch-feel book, Pat the Bunny, as an alternative to the baby whom he has persisted in trying to touch, in spite of many interventions by her. He is very responsive to this new experience. She holds him by his hand and wrist intermittently in order to teach him to feel the pages. They sit side-by-side, alternately looking at the book and each other. She touches him in a distal way, using her fingers to guide his hand or arm, without engaging in any more intimate touch such as holding hands. Tom is fascinated by the book from the beginning and remains focussed on it fairly consistently. His mother's attention jumps back and forth as she monitors Tom, the book, and his hand on the book.

A negotiation takes place, expressed through touch. She appears not to notice that Tom is already doing what she wants as he feels the book spontaneously. She takes his hands and makes him turn the page. She is not so controlling as to hold on to his arm, however, and she lets go. This exchange is repeated. (Several times his mother starts to seize his hand and stops herself before touching occurs. Her hand is

hovering over his.) Finally she makes him poke the page by holding his hand again - although he has not lapsed in his attention to the book. After she lets go, Tom tries to turn back to the first page he had seen, and she thwarts his movement by holding on to his wrist. She does not restrain him when he snatches away his hand. Tom then returns again to his task - feeling the book. They are interrupted, and Tom, alarmed, signals that he wants to be picked up. Mother responds readily.

Thus although she is controlling of his attempts to explore the book sensorily, and is somewhat disruptive of the flow of his attention, Tom is not distressed or put off. (His tenacity is impressive!) The exchange involves a negotiation, with each party trying movements, thwarting each other, and trying other solutions until something is found that is acceptable to both. Maternal touch plays both a physically supporting and a thwarting role in the exchange. Although Tom and his mother are in agreement with respect to exploring Pat the Bunny in general, they are in dissynchrony - i.e., they disrupt one another's attentional flow - with respect to the timing of movements. She interferes significantly in his exploratory behavior, although this does not stop Tom.

Narrative Analysis; 3b

A salient feature of this sequence is the moment of high engagement that occurs in the middle of a dissynchronous exchange during which Tom and his mother struggle over their activities with the book. Initially, they are in agreement as the mother comforts Tom in response to his worrying and they then spontaneously rejoin in exploring the book. She is

holding him on her thigh, in a position in which he appears very comfortable - her right arm and hand comfortably encloses his waist while her left hand manipulates the object of interest, and Tom as well. Thus they are in an intimate position with extensive body contact and considerable freedom of movement for Tom at the same time. Both are free to face or to avert from one another visually in this position.

Still trying to elicit Tom's attention to the tactile qualities of the book, his mother engages Tom in the spectacle of poking herself in the nose with it. When she tries it on him, he enjoys it at first - it appears to be both disruptive and pleasurable, like tickling. (Compare with the previous example of tickling, Ken, Observation 6.) However, she appears to misjudge Tom's readiness for this ploy: he is alarmed and distressed when she does it again. We may infer that this "poking" is an invasion of a highly sensitive area which is intense enough and/or fast enough to be aversive.

Tom's answer to the problem is to try to seize the book. They then have a "tug-of-war" with both pulling on the book. That is, he waves it and she holds on to it. (He is still ensconced comfortably on her thigh.)

When the book flies away Tom wants it back, and grins as his mother recovers it and brings it back to where he can resume exploring it. It is at this point that they burst into an expression of shared delight, which lasts no more than a few seconds. Tom says something indistinct and she replies. The vocal exchange is pleasant in tone.

So far touch has been used to physically support Tom, to engage

attention and stimulate arousal (poking), and to maintain control of the activity (the "tug-of-war"). The intense mutual engagement is expressed visually, vocally, and,in the "tug-of-war",through indirect touch.

The event continues in the same way as before. Tom again pulls his hand out of hers after she takes it and makes him pat a rough surface on the book. But as soon as she registers concern vocally and visually, saying, "That hurt?" - also giving him autonomy from her restricting and directing arm-grasp - Tom refocusses his attention and resumes his sensory exploration of the book.

However, when she again tries to control his exploration - this time by turning the page back (not by grasping Tom) he vigorously twists away. She restrains him, confining him with her grip around his waist and demanding, through this body language and through her resumption of holding the book, that Tom maintain his interest.

Now the interaction has become unpleasant for both: he is glum and she looks exasperated. She begins to look sad. As she is distracted by conversation he twists away again. She surrenders at that point and sets Tom down somewhat abruptly.

In the period after their brief burst of high synchrony the role of maternal touch has been to continue support, to organize Tom's exploration by guiding his hand, and, when she finally gives up, to deposit him somewhat roughly on the floor. Tom's concentration on the book is not interrupted by all these stimuli, and mother is only mildly frustrated by Tom. Oddly, she never perceives his great level of interest in the task she has conceived for him. The final compromise leaves them

separate, with her chatting while he plays with the book alone. This exchange is an instance of obvious maternal concern and affection accompanied by brusque handling.

Use of Classification:

Throughout, Tom and mother are in agreement regarding the task (exploring the book) while negotiating as to posture and position. There is a brief moment of dissynchrony with a mixed affective tone as she seizes his hand to make him explore the book. Further negotiations lead to joining in the task of exploring the book. Until she lets go of Tom finally, his mother holds him very comfortably with her right hand, so that there is an undercurrent of joining throughout. They then have a long interlude of "reading" the book, in which the joining in the task is constantly interrupted with negotiation & dissynchronies of varying degrees. A dramatic moment of joyful engagement -- a peak of joining -- occurs when mother retrieves the book. Another period of negotiation follows, with more extreme variations from the synchronous to the dissynchronous with a mixed affective tone. The volatility of the changes in levels of synchrony is impressive. Finally a compromise is reached: Tom plays with the book by himself.

Sal: I, 1, 1 Observation 11 (5',30")

Sal's mother stands holding Sal calmly face-to-face. She holds Sal securely with one arm around Sal's back. Sal stares at a child on the rug. Her mother rocks Sal strongly with an affectionate expression. Her smile looks tense to this observer. Sal grabs at her mother's dress and briefly tries to twist backwards. Then she slides down. Her mother has an expression of mild exasperation. Whining is heard -	Dissynchrony, Mixed Affective Tone, leading to Negotiation.

it is not clear if it is Sal.

Sal looks mildly distressed. (She may have been to start out with.) Her mother holds her hands, gently but securely. Sal's mother sits down and picks Sal up under the shoulders and puts Sal in her lap. Sal appears to twist momentarily as if to get off of mother's lap. Then her mother picks up Sal under the shoulders so that she is kneeling on her mother's thigh facing her. She strokes Sal's back and buttocks. Sal watches Tom over her mother's shoulder. Her mother looks earnestly into Sal's face. — Dissynchrony, Mixed Affective Tone, leading to Negotiation.

Sal quiets and looks around the room. Her mother pats her behind and strokes her head. She leans away for a moment. Her mother holds her around the chest. Sal leans forward and scans the room on the other side of mother. Her mother facilitates this posturally, helping Sal get comfortable. She pats and strokes Sal. We hear Tom's mother rebuke him off-camera, where Sal is watching. Sal and her mother look at Tom. Sal waves. Sal's mother again looks seriously into Sal's face. — Joining; Negotiation; Joining; Negotiation

Sal's mother invites Tom over, saying: "Come play with me," in plaintive tones. Tom's mother comes with him to visit Sal. (1'13" has elapsed.) The mothers try to get the babies to greet each other by making them pat hands and saying, "Make nice!" Sal smiles and waves. Sal appears to enjoy having her hand made to stroke Tom's hand. Tom continues on to the play area. Sal's mother says something to Sal, both stare after Tom. (1'37") — Joining; (Peak)

Sal sits back, facing mother, on her mother's right thigh with mother's right arm enclosing her waist. Sal and her mother watch in fascination as Tom's mother swings him by the arms (off-camera). Then Sal, still in the same position, stares at and fingers her mother's mouth. Both Sal and mother look very serious. Then she twists around scanning the room. She appears fascinated by the children on the rug, looking intently at them. The mothers are chatting. Sal's eyes widen every time her mother's voice rises in volume. — Joining; Accomodation

Sal rubs her eyes and closes them. She leans into her mother and squeals in distress. Sal turns back to face the room looking a little worried. Her mother whispers to her and looks intently into her face. Her mother puts her on the floor, still holding her under her shoulders. (4'7") Sal stays leaning forward into her mother. She appears anxious; her squealing — Dissynchrony, Mixed Affective Tone, alternating with Negotiation

continues. Her mother changes her hold on Sal so that one hand rests lightly on her left arm, poised as if she were deciding whether to lift Sal or let her go. (Other hand remains on Sal's body.)

Sal stops squealing and looks over her shoulder at the other children. Then she rubs her eyes again, puts her head down, and squeals again with a sound of mild distress. She takes her left hand from her mother's hand and puts it in her mouth. When she removes it her mother takes her hand again. She stops again to look around. This cycle is repeated a few times. After about one minute of this, her mother picks her up under the arms. (5'20") She walks up and down with Sal in her arms. End of tape. (5'30")

Dissynchrony, Mixed Affective Tone

Narrative Analysis:

This event illustrates 5'30" of continuous touching. (It was Sal's second day in the nursery, which may have contributed to some reluctance to separate, for both mother and infant.) Sal's mother uses touch to support Sal, to maintain control, and, episodically, to organize her attention or to facilitate it. Clashing of purposes becomes manifest when Sal tries to get distance from her mother. When Sal is not quietly watching the other children playing she shows diffuse distress which appears to be related to attempts to separate. Except for her initial twisting away (thwarted by mother), Sal gives ambiguous signals regarding her wish to separate. Her mother holds her throughout, using variation on a face-to-face position in her lap or holding Sal in a standing position in front of her with her hands or body securely held. The face-to-face position usually accompanies dissynchrony in this event. (Sal and mother are in better agreement when she is able to scan the room over her mother's shoulder or to turn around to watch the room.) Sal's mother often leans forward to try to engage Sal (It may be that

the face-to-face experience is aversive for Sal.) Her mother keeps experimenting with different positions.

Her mother handles Sal with a full, open-palm grasp. She holds Sal by the body most of the time. When Sal's mother "lets go" of Sal, she is still holding her securely by the hands. Sal's mother frequently pats and strokes Sal's back and buttocks. After about 3 minutes, Sal's mother puts her on the floor, standing to face her, holding Sal by the trunk and the arm. Thus there is extensive touching of Sal's back, her trunk, the back of her head, her buttocks and arms, but no facial touching.

Her mother seems highly focussed on Sal, understandably. Sal, on the other hand, is fascinated by what is going on in the room; she is in an exploratory mode when not distressed, even exploring her mother's mouth with her fingers after watching Tom and his mother play. The essential point being negotiated in this encounter is distance. Compromise is achieved episodically. (For some reason the mother does not think of separation as an option.) In a sense, Sal solves the problem by moving around until she can see the rest of the room clearly. The mother makes small postural adjustments in her own position to facilitate this. Sal does not use self-touching as an alternative until more distance has been gained.

A peak of synchrony comes about in a surprising way: After Sal's intense visual interest in Tom's play with his mother is interrupted by Sal's mother trying to engage Sal visually, Sal then enjoys her mother's making her pat hands with Tom, and she flaps her arms in excitement. This represents a peak of synchrony in this event. It is

not "engagement" in Beebe and Stern's (1977) sense. However it may be another manifestation of the same process or a related process. It represents a high level of cooperation and shared interest.

There follows a fairly long period (about 3 minutes) of low-level agreement, punctuated with momentary lapses into dissynchrony when Sal leans away from mother or fails to respond to her mother's patting. Finally, approximately one minute of dissynchrony follows, punctuated by brief moments of quiet when Sal looks around the room - her mother does not facilitate Sal's looking around in this phase.

In summary, some degree of joining or synchronous behavior occurs in this event primarily when Sal initiates scanning of the playroom. Her mother offers Sal variations on restrictive holding punctuated by frequent failed attempts to engage Sal visually, from which Sal averts her gaze.

Ironically, Sal's mother is clearly concerned about Sal's discomfort, and touches her with deliberate movements, well-paced for a baby's response time, delivered without abrupt transition or high levels of force - in other words, with observable gentleness. She frequently strokes and pats Sal with obvious affection. There is an ongoing synchronousness with respect to physical handling. Yet she is out of synchrony with Sal with respect to helping Sal follow the flow of her own attention and need for movement in space. At times soothing appears to be used to maintain close contact rather than to soothe the child's distress. The "hovering" touch seen at the end may be confusing to Sal; the mother's intent is unclear to the observer.

For Sal, her mother's gentleness may be thwarting in this event. Thus touch bears a mixed message in this case. (It must be noted that in subsequent observations Sal and her mother separate and reconnect with ease.)

Use of Classification:

This interaction is characterized by ongoing joining with respect to the mother's physical handling and simultaneous negotiation with respect to position and distance. That is, the pace and intensity of the mother's touching is well-matched to the infant's thresholds and tolerances, and the infant, for her part, is accepting of the mother's handling on a physical level. On the other hand, the infant often tries to adjust her posture or to separate altogether. Sometimes the dissynchrony reaches the level of dissynchrony with a mixed affective tone.

In the beginning, dissynchrony with a mixed affective tone leads to negotiation and compromise -- Sal standing on the floor facing her mother with her mother holding her hands. Again Sal becomes distressed, so that dissynchrony with a mixed affective tone again leads to negotiation. Her mother tries various positions and soothing techniques. Another compromise is reached: with Sal watching Tom, and mother seating Sal on her lap. Negotiation continues as the mother continues to try to elicit something from Sal by staring into her face and stroking her. Sal is restless and unaccepting of her mother's soothing. They then join briefly in watching Tom. Again Sal's mother looks intently into her face, seemingly attempting to elicit something. Again this appears to disrupt their cooperation in watching Tom. Then a high level of joining occurs as Sal greets Tom, with her mother, and continues as Sal

explores her mother's mouth with her fingers. After a brief period of negotiation with a positive tone, which consists of Sal turning to scan the room and her mother adjusting both of their postures to facilitate this, a period of more dissynchronous touch and negotiation takes place. Sal and her mother cannot find a compromise. They continue to try over a period of minutes but cannot get comfortable.

Ken: XV, vi, 3 (No sound) Observation 12 (34")

Ken is dressed to leave the nursery with a jacket and cap on. He is sitting with mother on the rug. He puts his left finger in his mouth. He looks around the room	
His mother is kneeling behind him having just laced his cap. She takes his right hand, then his left hand and poises both hands momentarily before she just extends her hands as if in a hand shaking position while Ken's fingers curve over hers as if he were on a chinning bar, with his palms touching hers. He totters onto his feet. He looks around the room with an expression of concentration.	Negotiation Joining
She allows him to totter there, by holding his hands steadily from behind. After he takes a lunging step into the playroom particularly energetically, she stands up and walks him across the play area toward the door. (25" have elapsed.) He moves along with her with a purposeful air. The camera leaves Ken and his mother. (They are not leaving as yet.) (34")	Negotiation Joining

Narrative Analysis:

This event begins, like example 6, with Ken enjoying a moment of "open time". His mother evidently decides to stand him up, although it is not clear how she comes to that decision. She holds him loosely by the hands from behind. They make no attempt at any gaze interaction. "Consultation" is seen - she gives him time to respond to her raising

his arms. Even though she is holding him loosely, her position gives her control over his movements in that his balance depends on her.

The mother initiates the contact in taking Ken's hands and pulling him up. He seems to enjoy it. When he does start across the room she accommodates in a major way, rising to follow along behind him. Ken is very interested in the walking. The mother's face is hidden from our viewpoint so her affect is hard to judge, but her movements are comfortable and relaxed and it seems that she is at ease. Presumably she is absorbed in monitoring and supporting Ken's activity, judging by the deliberateness of their passage across the room.

She holds Ken in such a way that he has a lot of freedom of movement. She does not pull him up immediately whenever he starts to lose his balance, but lets him totter slightly. She is giving him room to fall slightly and simultaneously giving him support, thus encouraging him to master standing up. In order for this to work, Ken has to be satisfied with this level of physical support, which he is. This involves a high level of cooperation and awareness of the other, by both Ken and his mother. The role of touch is to facilitate his efforts and in the process to convey to Ken that he is understood in terms of his timing and pacing, frustration tolerance, and fear of falling.

Use of the Classification:

The episode begins with the mother offering to "walk" Ken by taking his hands. In a brief negotiation Ken accepts the invitation. They then join in walking Ken across the room. With each step Ken experiments with a new position, regains his stability, making an implicit

demand for a postural adjustment from his mother. For her part, she must adjust to his new positions and his range of movement to give him just-enough support. Thus they join in the task (walking with support) while negotiating as to physical posture, position, and support.

Ned: X, iv, 6b — Observation 13

(24")

Ned is in his mother's lap. She is sitting in a chair. She holds him under the shoulders to face her, standing him up on her legs. (His back is to the camera.) She lifts him, looks into his face with a slight smile, and lowers him again.	Negotiation (Mo. eliciting response)
Ned relaxes into her, lying down on her. He is looking to her right. Their faces are side-by-side. Her hands are clasped around his buttocks. She is lying back in the chair. She turns to face the camera: she is no longer smiling but looks comfortable (Ned cannot see her face.)	Joining
Ned is staring at something to his left and touching it - it appears to be the back of the chair. His mother looks into Ned's face - she is silent but the feeling conveyed by her movements is that she is encouraging his attention, as if to say "See?" as she watches Ned.	Negotiation
He continues to handle whatever it is. He stands momentarily and then falls back on his haunches, on mother's lap.	
Ned leans forward and she rubs his forehead with her lips very slightly and very gently. Ned shoves his right hand into his mouth. He appears for a moment to be mouthing something - cannot tell what.	Joining (Peak)
They stay silently touching for a few moments. Then Ned sits up on his haunches, looking off to the right with his right thumb in his mouth, while he toys with his mother's blouse with his left hand. The camera leaves Ned at this point. (24")	Negotiation Accomodation

Narrative Analysis:

This event begins with affectionate play as mother holds Ned in her lap. He then remains lying on her in a manner that seems almost aimless. (We cannot be sure because we cannot see his face and both hands.) This may be another example of Sander's "open time" (1983), in which the infant is free for a brief moment to contemplate itself and the environment. There is more affectionate touch at the end.

After the initial exchange of gazes, she holds Ned in an enclosing manner for most of the event, with her hands clasped around his behind, encouraging him to lie down on her and allowing him limited freedom of movement. For a moment their faces are side-by-side; it is affectionate in a very subdued way. She goes in and out of the face-to-face position while Ned remains lying on top of her and continues to touch the unknown object behind mother.

She joins him in this, using facial and vocal communication gestures to show him that she is "with" him as he plays very quietly with it.

Finally he loses interest, sits up, and then falls back into a position similar to the previous one. His sitting up may represent a brief need on Ned's part for more distance, followed by a compromise when he sits on his haunches. They remain almost still with mother affectionately touching Ned's forehead with her lips. This moment represents a peak of engagement for Ned and his mother.

He withdraws, sitting up and looking around. He sucks his thumb while she is kissing his forehead and afterward. Mother appears to have the initiative in touching behaviors, and in the interaction in general,

until the end, when Ned disengages partially by sitting up and looking around.

The low energy level of this pair makes it difficult to assess their level of agreement during this event. There is frequent but subdued negotiation over distance, opportunities for visual engagement, and extent of body-contact. They are functioning more cooperatively than they were in observations made earlier in the month. Ned readily accepts her interventions. She uses a lot of extensive-body contact and enclosing touch ("swaddling"), with frequent face-to-face exchanges. We cannot tell if full engagement takes place at those times (It appears that there is high engagement.) Ned and his mother seem to alternate between a very quiet, slowly paced exchange and a more active, but still very deliberate exchange in which she uses gaze and light kissing to make contact with Ned. Touch is used to express affection, through kissing, in a very gentle way. A highly sensitive area is touched for both mother and child (lips and face). Ned responds with intermittent withdrawal and approach. Touch with the hands seems to be used primarily for holding in the case of this pair. Both are solemn, almost glum. It is not clear what meaning his thumb sucking could have. He may need to modulate his experience in some way through focussing some of his attention on himself.

Use of the Classification: The episode begins with negotiation, as the mother tries to elicit a response from Ned. They join as Ned relaxes into her and she clasps her hands around him. Interetingly, visual engagement is precluded in this position. For a few moments, passive contact appears to be the mode. Again they negotiate as his attention is

drawn to the back of the chair and she looks into his face, apparently joining Ned in playing with the back of the chair. They negotiate again as Ned withdraws posturally. His mother does not adjust her position in response, and Ned falls back on to his haunches on her lap. For a brief moment there is a high level of joining as Ned leans forward and she nuzzles his face. Ned then withdraws in position by sitting up. (This would allow for the possibility of a more visual engagement.) This constitutes a brief negotiation.

Ann: XVII, 1, 1. (no sound) Observation 14 (6')

Following 13 min. of diapering and dressing for departure:	
Ann sits in mother's lap. Mother's hands clasped around Ann's tummy. Both facing forward - mother is sitting on couch. (Ken and his mother are sitting on the other (rt.) side of the couch in a similar position.)	Passive Contact
Mother hugs Ann. Buttons more buttons on Ann's sweater. Ann yawns. Ann has a solemn expression. She looks down to her right. mother's hands rest easily on Ann's thighs, gently enclosing her stomach. Ann rests her LH on mother's LH. She turns and looks to her left. Ann brushes her mother's fingers with her own. Seems a little restless. Mother pats Ann's hand slowly and gently. (Mother's fingers move up and down slowly.) Both are watching Ned's mother walk him.	Joining Negotiation Joining as to watching Ned; Low key Negotiation as to position and posture
After about 2 minutes, Ann looks up briefly. Same position. Mother leans forward to look into Ann's face - smiling, apparently trying to elicit some kind of reaction. Ann looks up to her right, shows a look of recognition, looks down, smiles shyly.	Negotiation; mother directing attention
Mother leans over her with a smile, enclosing the top of Ann's head with her neck and smiling. Ann looks serious. She looks up again to her right, in general direction of Ken and his mother, also on the couch. Mother easily and	same

quickly accommodates Ann's turning to the right. Dr. Resch, who has come up behind the couch, is also an object of Ann's interest. The camera moves briefly to Ken. (It is not clear when Dr. Resch appeared.)

When the camera returns to Ann, she is in the same position, her LH still resting on mother's, looking up to the right. She has a big smile - but looks a little shy. Her grin widens; she fingers her mother's fingers. Again her mother leans over her with a tender smile nuzzling briefly with her chin. Her mother's hands have not moved. Ann leans forward and laughs. — Negotiation; mo. focussing Ann's attention

Her mother, turning to the right, stands Ann on the couch facing Dr. Resch. Mother holds Ann with RH on waist and LH on Ann's upper left arm. (This frees Ann's RH.) Ann carries on a conversation with Dr. Resch, who is sitting in a chair is behind the couch. Ann laughs and bobs up and down. Her mother lets go of her waist and just supports Ann's left arm. Then mother lets go altogether. Her fingers touch the bottom of Ann's sweater as mother's hand hovers next to Ann. Her mother smiles too, leaning over Ann. Ann turns back to her mother with a big grin; she turns halfway and touches her mother's face with the back of her hand, smiling. She turns back to Dr. Resch. — Negotiation as to position; Joining as to facilitating interaction; Joining (Brief)

Ann turns back to her mother and bobs up and down. She turns back to Dr. Resch, whose hand rests on the back of the couch. Ann fingers Dr. Resch's hand. Her mother's hand hovers near to support Ann - may be touching - can't tell. Ann and Dr. Resch carry on a dialogue. Ann looks thrilled. Her mother, watches, looking pleased. She fiddles with Ann's pants. The conversation includes Ken's mother; we see her hand moving back and forth. Ann is laughing. She bounces up and down. She takes hold of her mother's jacket with her left hand for support. — Negotiation; Mo. trying to facilitate; Instrumental; Joining

After about two minutes of this, Ann falls to her knees. Her mother picks her up with her right hand around Ann's waist and her left hand supporting Ann's left hand in such a way that Ann's forearm is lying atop her mother's left forearm. Her mother raises Ann to her feet and helps her walk toward Ken and his mother. (All are on the couch.) Big smile on Ann's face. She holds on to her mother's collar as she leans forward. Both grinning. Her mother appears to be — Negotiation, leading to Joining

restraining Ann slightly. Ann pats her mother's face and then turns to look at her. They look at each other momentarily with an affectionate expression. Some kind of mutual "aha" - some mutual recognition, or engagement - takes place at that moment.	Negotiation Joining (Peak)
Ann's mother fiddles with her clothing. She says something to Ken's mother. Dr. Resch moves away. (Camera angle changes so that we see them from the left and the interaction is more obscured,) Ann leans on the couch. By contrast she seems unhappy, although her mood may simply be neutral. We cannot see her clearly. Her mother pulls her pants back and inspects. Ann leans with her whole body against the back of the couch. She puts her finger in her mouth. She lays her head down on the back of the couch too.	Instrumental Instrumental; Accomodation
About five minutes have elapsed altogether. Ann's mother picks her up under the arms. We can't see her mother's face - off screen. Her mother tries to get her left arm under Ann's behind. However, Ann's feet are moving restlessly. Her mother tries repeatedly to get Ann to stand on her thigh, but Ann's feet curl up whenever she tries. Her mother can't put Ann down to readjust her position. Finally her mother gets Ann's feet in between her thighs and uses light pressure to hold them there, to stand Ann up momentarily, and to slide her (the mother's) left hand down Ann's body and into position under her buttocks. She stands up with Ann in her arms. The camera moves off Ann and her mother.	Instrumental touch leading to Negotiation Dissynchrony, Mixed Affective Tone, leading to Negotiation Accomodation
The camera returns. Her mother stoops and picks up bag while holding Ann in the crook of her arm. Ann's back is to the camera. Ann is still, cooperating, sitting on her mother's left forearm. Her mother holds her close. She then clasps hands under Ann. No apparent interaction otherwise. As they walk out she readjusts her position slightly; Ann is quiet, looking ahead. (6')	Same

Narrative Analysis:

Most of the observations of Ann and her mother are active and changeable. This one involves long periods of relative calm.

It begins with about 2 minutes of Ann watching Ned from the vantage point of her mother's lap. Ann and mother watch Ned together. Ann's mother appears to be holding her in a very enclosing way. Ann and her mother exchange hand-pats. Mother may be using gentle patting of Ann's hands to maintain Ann in a quiet state. Ann and her mother engage visually, briefly with one another. Ann appears to be the initiator in both of these patting and looking exchanges. Ann's mother nuzzles Ann with her neck as Ann engages Dr. Resch. Perhaps the nuzzling is intended to reassure and encourage Ann. Her mother facilitates Ann's movement toward Dr. Resch, and her "dialogue" with her, first, by accommodating posturally to Ann's turn to the right, and, second, by standing her up on the couch to face Dr. Resch and supporting her so that Ann's right hand is free. Mother then maintains a hovering touch while Ann becomes more and more thrilled in "talking" to Dr. Resch. With her handling of Ann, Ann's mother is both facilitating that exchange, and, perhaps, asserting her prior claim on Ann's attention. (Ann grabs for her mother a moment later, after mother has almost let go.) Like the preceding phase, this also lasts for about two minutes. Ann continues to divide her attention between Dr. Resch and her mother, reaching back for support as she is engaged visually by Dr. Resch. Finally she loses her balance and falls.

Mother assists her to her feet and her attention shifts to Ken for some unknown reason. Then mother facilitates Ann's approach to Ken and his mother in a similar way, only this time she is restraining and supporting all at once. This is not aversive to Ann. In fact, she stays "in touch" with her mother by reaching back to hold Mother's collar for support and even breaks off from Ken to turn back to mother for an

intense moment of engagement. Again, the occasion for this is unclear. It appears to be related to Ann's feeling her mother's face while looking at Ken, and turning back as if in surprise. Again Ann is very active in initiating these events.

It is also unclear why Ann now becomes glum (Dr. Resch has moved away: "the party's over". The mothers are gearing up to depart.) Ann puts a finger in her mouth, perhaps for consolation. Her mother responds to Ann's mild sadness by inspecting her clothing at first, and then tries to pick her up.

When her mother picks up Ann an interesting dissynchrony occurs as mother tries to get Ann into sitting position on her arm and Ann keeps curling her body under her so that her mother can't shift her grip. Ann may simply be curling up prematurely; or, it may represent some resistance. Finally Ann calms down as she sits securely on her mother's arm as she is carried out.

Touch is used in a great variety of ways in this example. At first, mother's touching encloses, supports, and then expresses mother's awareness of Ann. Then mother's support facilitates Ann's visual exploration of and engagement with others in the room. It is the child's reaching back for and discovering the mother that leads to moments of intense mutual awareness and pleasure in that awareness. Caretaking and restraint are less involved. The "hovering touch" - a part of monitoring and staying ready to provide support - is not unusual in the data. For most of this episode Ann and her mother very quickly find mutually satisfactory positions and forms of touch and holding, except at the end. Mother and child seem attuned to one another's needs in this event.

Use of the classification:

Ann and her mother are essentially joining at first as they sit on the couch. Then a negotiation occurs as the mother tries gesturally to facilitate Ann's engagement with Ken and then with Dr. Resch. Again they join in this activity. Negotiation follows on posture and position. Ann finally separates, facilitated by mother. She reaches back for contact or for physical support at intervals during her excited dialogue with Dr. Resch. Her mother accomodates to these contacts readily. This contact is highly pleasurable for both -- two highly synchronous moments occur. (joining) Ann's mother indulges in some purely instrumental handling (checking diapers) in the midst of all this.

Then Ann and her mother negotiate and join in a new activity -- the exchange with Ken. A negotiation follows regarding distance,with mother restraining Ann. This is follwed by a dramatic peak in joining as Ann reaches back to rediscover her mother.

A period of Instrumental / Accomodation touch follows as the activity breaks off. When mother picks Ann up, a negotiation follows as Ann resists being picked up. The synchrony level varies between negotiation and dissynchrony. Finally accomodation is reached as Ann perches on her mother's arm.

These observations illustrate the ongoing frustration, negotiation, and compromise taking place between the mother and the nine-month old infant. Touch plays a major organizing as well as disorganizing role for the infant in these data, which represent a brief window on the evolution of the mother-infant relationship as it moves through the cycles of struggle, negotiation and resolution described by Sander(1983). Brief peaks of synchronous behaviors, involving joining in an activity, shared attention or arousal, or cooperation, were seen in mildly dissynchronous contexts. These peaks tended to be associated with close, intimate body contact, a position allowing the infant a high degree of freedom of movement while being held closely,and opportunity for face-to-face contact. In most cases, interludes of frustration led up to synchronous moments during touching events.

Summary

Touching events in mother-infant interaction provide a sensitive microcosm of the relationship. This study has proposed a classification of touching behaviors of the mother and baby that focusses on the importance of synchrony and dissynchrony. Both synchrony and dissynchrony are seen as adaptive. This classification, an ordinal scale, is summarized as follows.

1. Instrumental Touch; Mother and Infant at Cross-Purposes. Essentially this involves restraint or limit-setting where touching plays a purely instrumental role. This differs from subsequent categories in that touching in this situation is not a communication, except indirectly; it merely changes the physical location, posture, or position of the infant. (Obs. 1)

2. Instrumental Touch: Moderately Dissynchronous Interaction. Mother and child are not in conflict but are unable to join in a complimentary way, or they interfere with or disrupt one another. Touch does play a communicative role in this category of event, although the mother's intention is primarily instrumental. (Obs. 2)

3. Passive Contact. Touching occurs with no other perceptible interaction or intention, as when mother and child lean on one another over an extended time. In such cases, subtle cues may be transmitted out of the observer's awareness through posture and tone. (Obs. 3)

4. Instrumental Touch / Accomodation. One partner initiates or changes the touching while the other adjusts or accomodates without initiating a new position, movement, or touch in responses. (Obs. 4)

5. Touch in Dissynchronous Interactions with a Mixed Affective Tone. Mother and Infant oppose one another in the course of some shared activity. In one event, for example, a mother kissed her child affectionately while he pulled away. (Obs. 5)

6. Touch in Dissynchronous Interactions with a Positive Affective Tone. Playful tickling or poking is a good example. The dissynchrony is to be found in the invasive, intrusive, and surprising aspects of the mother's touching of the infant. (Obs. 6)

7. Negotiation. In this situation mother and infant are active and highly aware of one another They are not in harmony, but are actively working out compromises in choice of activity, activity level, distance, or posture. Touch plays a major communicative role in the negotiations, conveying such messages as, "Come here, go there, stay here, stay in this position, do (something), quiet down, pay attention, I'm aware of you, etc." (Obs. 7)

8. Joining. This refers to a high level of cooperation during touching interactions. Examples are successful soothing, touching games, or moments of high interpersonal engagement. (Obs. 8)

9. Close Cooperation. This refers to action in unison, with mother and child facilitating one another's movements, as is seen in the "shared action patterns" observed by Stern in 1977. (Obs. 9)

This classification, or scale, has been applied to extended touch events to illustrate a use of the scale and to show the temporal patterning of synchrony and dissynchrony in touching. Over time, mothers and infants move in and out of synchronous and dissynchronous touching. Different levels of negotiation, cooperation, and harmoniousness are achieved. High synchrony occurs in relatively brief moments. Touching interactions may vary in terms of different patterns and combinations of synchronous and dissynchronous touch behaviors.

Finally, for these mother-infant pairs, touch was not a unitary phenomenon, a background event, or a fixed aspect of the interaction. Touch varied constantly in specific and discrete ways within each pair in the free-play situation. (While this observation may appear trivial, most studies of the subject fail to take account of this fact.) Sometimes the changes followed an observable pattern, sometimes not. Ned, for example, was the recipient of affectionate and sensitive touching in grooming, while limit-setting elicited brusque handling. Variations occured from moment to moment, minute to minute, and day to day in the following aspects of touch: frequency; duration; restriction of movememt; grasp (location touched, sensitivity of location, extent of body touched); pacing; timing of transitions; and activity level. Variations also occured in these concomitants of touch: frequency and duration of visual engagement; affect expressed; initiative; and duration of attentional focus. It was difficult to characterize any of the mothers' touching behaviors along any single dimension because of the changeableness of their touching of their infants.

V. DISCUSSION

The literature does not prepare one for the enormous variability of the mothers' touching of their babies and for the great range of normal touching that is seen in a natural setting. From a clinician's point of view, this is an important observation, since clinicians are so often called upon to judge the normalcy of relationships. This variability is implied in such work as Schaffer and Emerson's (1964) research showing that infants have different preferences for degrees of closeness and intimacy, and in Sander's (1983) model of a developmental sequence of negotiations and compromises through which each mother-baby pair must work out its own equilibrium. Touching is a fundamental medium for these negotiations in the first year of life, along with visual and oral communication.

The major hypothesis generated from this study is that synchronous moments in touching events were not only brief but were imbedded in a more-or-less dissynchronous context. In this study it was rare for a mother and her 9-month-old to be in close agreement in touching for very long during free play. Highly synchronous moments during touch-events, such as moments of shared delight, sharing of attentional focus, moments of high engagement (whether through visual or touch-interaction), or close cooperation seemed to be associated with periods of active negotiation. In other words, for most of the time, mother and infant appeared to be having some difficulty in getting comfortable, "working things out", getting the other to cooperate, or figuring out what the other wanted. Synchronous moments appeared to be pleasurable and this

may be an important motivation for both mother and infant. This parallels the phenomenon of pleasure in mastering disruption (Brazelton and Als, 1979).

Gentleness and sensitivity of touch did not seem related in any clear way to synchronous events, or to the general confidence or comfort of the babies in this sample. This requires further study. The babies often reacted to highly instrumental touching in this sample with indifference or with signs of arousal of attention to the environment rather than with distress.

Brazelton and Als found that a certain amount of disruption is needed by the infant in order to have the experience of mastery over one's own state. They see the regaining of self-control and alert attention after a disruption as a powerfully rewarding and motivating experience for the infant. (1979) This study in a different domain suggests an explanation for the infants' tolerances for contradictory and even aversive experiences of brief duration.

In her study of the effects of parental touch on 10-year-olds' body concepts, Weiss found that moderate vehemence of handling by parents was correlated with positive feeling in their children for their bodies. She also found indications that habituation was an important factor (1984). It is unlikely that the infants in the present study were simply habituated since occurences of disruption were highly variable and the mothers' occasional vehement touching was relatively infrequent. It is more likely, in view of these data, that a specific mixture of aversive and non-aversive aspects of maternal touch allowed the infants some "breathing room", so some disruption had an organizing effect. The

negative aspects seem thus to be dissipated. Winnicott (1953/1971) and Sander (1983) emphasize the importance of the baby's ability to maintain a sense of inviolability of the "private core" (Winnicott, 1953/1971, p.46), as the fundamental basis of a sense of an intact and in-control self. While abrupt, intrusive, or highly controlling touching might well be particularly distressing to infants, the data of this study suggests that major violation requires much more aversive touching over longer periods of time than the give-and-take seen in this data.

The importance of moderate amounts of frustration and the experience of coping with it is underscored by the observation that highly synchronous moments during touching often seemed related to the attainment of some mildly difficult goal. In these cases the role of touch was primarily that of physical support and facilitation, in which the mother held the child close in order to do something together or simply to engage with the baby. In the cases of Lea (Obs. 7) and Piq (Obs. 8) the frustration which was relieved (they wanted to be picked up) closely paralleled Winnicott's (1963/1965) comments on the importance of the infant's experience of frustration for the creation of the object separate from the self. Presumably the pleasure involved in overcoming the frustration and "joining" with the mother at such moments enhances positive feeling toward the object. The experience of being held and supported at such times tended to involve being supported physically with a full, open-palm grasp; a face-to-face position, and with a pleasurable affective tone.

In extended touch events involving patterns of synchrony and dissynchrony the baby presumably tries to make sense of the contradic-

tory communications seen during touch. A dramatic example of this was seen in the occasional lack of fit between the form and quality of touch, on the one hand, and the context of the exchange on the other. How does a nine-month-old infant integrate a complex experience such as Sal's being held in a way which is both soothing and thwarting? (Obs. 11) One might speculate that such experiences might introduce the child to the complexity of the caregiving object. That is, the baby may not experience the mother as a single phenomenon but as a variable one, who can be gratifying or frustrating or both at once. Contradictory communications would also prepare the child for "double-messages". If these "contradictory experiences" are brief they may not be terribly frustrating or confusing.

Touch is commonly depicted as the most fundamental, direct, and essentially honest mode of communication (Montagu, 1978; Russell, 1925; Thayer, 1982). These data suggest that touch can be the medium for highly complex or contradictory messages,or for shaping communications from the mother. Further, it appears that sorting out such communications is part of normal development for the infant. This expands upon Thayer's observation that touch "rarely has a unitary, unequivocal meaning...the meaning can vary profoundly depending upon a host of other factors." (Thayer, 1982, p. 266)

Resch and Grand's clinical case of an autistic toddler (1985) illustrates the importance of maternal regulation of the child's sensory experience for the child's movement from a primarily biological symbiosis to a primarily psychological symbiosis. In this model the "biologic and organic matrix for the development of self and of object

representations", is "the baby's range and use of perception, attention, stimulus thresholds, stimulus-modulating mechanisms, pacing, synchrony, and sensory-motor integration" (Resch, Grand, & Meyerson, 1981, p.286). Experiences in these areas enhance the infant's awareness of its' own body self and increasing capacity to focus its attention. This process culminates in the differentiation of the self and the object representations and their endowment with psychological meaning. (Ibid., 1981; Resch, Grand, & May, 1983; Resch & Grand, 1985)

When the mother gives partial support to the child through different positions, as in walking or raising himself up, child and mother are forced to become highly aware of one another through proprioceptive, kinesthetic, tactile, and vestibular sensation, as they experiment with levels of freedom and control. It seems reasonable to suppose that such intensified experiences aid the baby in the construction of specific sensori-motor schemas, richly endowed with associated feelings and sensations. Following Beebe and Stern's reasoning, such schemas could form substrates around which experiences of self and other could coalesce. The examples of extended touch illustrate the critical role of timing in determining the impact of touch upon the infant. The infants in our sample were more disrupted by affectionate, gentle handling delivered at inappropriate moments than they were by brusque handling. Thus timing of touch interventions,as a factor in the infant's maintenance of an alert state, is of importance for the infant's ability to elicit joining with the mother and to make use of the mother as a mediator and organizer of the sensory world.

Beebe and Stern propose specifically that subtle micromomentary

exchanges of cues between mothers and infants become basic schemas from which object relations and defense mechanisms develop (1977). These exchanges include "shared action patterns" by which mothers and infants learn to anticipate each other's movement sequences and to interact more rapidly than can be explained by a stimulus-response interpretation of events (Stern, 1977). This was seen in the "simple accommodation" and "close cooperation" levels of interaction. (Obs. 4, 9)

In this study, touch is an important medium for the signals involved in the learning and then in eliciting of the "shared action pattern". If Beebe and Stern's hypothesis is correct, then the touch-signals involved must be part of the sensorimotor schemas that become the basis of the infant's developing object relations and defensive operations. (For example, in observation 9, the touch cue(s) would be the combined visual, tactile, proprioceptive, kinesthetic, and vestibular sensations of being picked up and placed in position to look over the mother's shoulder. Ann reacts automatically to accommodate the new position by folding her legs up as her mother's arm slides under her buttocks.) We can assume that the cognitive experience from Ann's point of view includes some awareness of meshing smoothly with the mother's movements in purpose and in physical action. Repetition of patterns of this sort over time in relatively pleasurable contexts might establish sensorimotor schemas assimilating this multimodal, multisensory experience of mother, including the awareness of being joined with her in carrying out an action.

Shared action patterns include component interactions that are so rapid that they must be assumed to be out of awarenesss. However, if

shared action patterns are internalized and do indeed become part of fundamental psychological structures, they must be learned and internalized through the mediation of interaction. To some extent, the shared action pattern is learned in a biological (chiefly sensory) rather than a psychological way. Such touch experiences would join with visual and other sensory experiences to enhance the developing internal representation of a separate caregiving figure.

Attachment theory suggests that mothers' holding and touching of their infants can be fairly neatly categorized and used as an indicator of the quality of the relationship and of the child's investment in exploring the environment. (Ainsworth, 1978; Biggar, 1984) While this may be true in general, the data of this study suggest that the role of touch in the relationship is multi-faceted with respect to synchrony and dissynchrony. These data suggest that during touch interactions there are simultaneous synchronous and dissynchronous processes, and that dissynchrony has an important developmental role. This study did not focus on particular dimensions of interaction, or matching of mothers' and infants' cues, or on micromomentary mother-infant exchange. Rather it examined changes in touching behavior over time as mother and infant moved in and out of different levels of synchrony during touch (Cf. Brazelton, Kozlowski, & Main, 1974; Brazelton & Als, 1979; Rocissano & Yatchmink, 1984). The concept of synchrony studied here is a variable of the interaction rather than of individuals, and it is observable at the non-micromomentary level (Cf. Stern, 1974; Beebe & Stern, 1977).

Directions for Future Study

The proposed classification of levels of synchrony needs to be tested systematically, using multiple judges to assess the observations, to validate the classification, and to test the hypotheses generated regarding the importance of patterns of synchrony and dissynchrony. Further research would need to involve training observers in the use of the classification and in the use of measures of the relevant infant variables. In view of the great variability of the individual mother-infant interactions, a number of behavior samples would have to be taken over time to obtain a generalizable result.

These data suggest that synchronous and dissynchronous aspects of touch are important organizers for the infant's attention, perception, level of engagement, activity level, affective tone, and state management. The relationship between patterns of synchrony and dissynchrony and the baby's time spent in the alert state, ability to sustain attention, ability to modulate state, ability to explore, and tolerance for engagement should be examined. The timing of touch interventions appears to be of particular importance. It is likely that the importance of synchrony patterns in touching differs at various age levels.

Frequent, moderate-level dissynchronies between mother and infant during touching were observed in this study and are hypothesized to be a typical, ongoing condition during free play at the age of nine months. These mildly dissynchronous episodes are punctuated by brief peaks of highly joined activity involving shared attention, close cooperation, visual engagement, or heightened awareness of the other.

The occurrence of peaks of highly joined activity, shared attention, or mutual awareness during touching was characterized by: (a) (a) Mother physically supporting the infant rather than holding it more distantly. (b) Mother holding the infant in a face-to-face position. (c) A full, open-palm grasp rather than a more distal, psychologically removed type of touching such as a fingertip grasp. (d) Initiation by mother. (e) The infants' achieving of some goal after a period of frustration and struggle usually preceded the peak moment. (f) Absence of self-stimulation such as thumb-sucking. (g) Gentleness or sensitivity of touch are not clearly related to the occurrence of peaks of joined activity, cooperation, etc. during touching.

Testing of the generalizability of these propositions should be structured with the preceding observations in mind. The typical format of seated infant, mother facing (without physical contact),which has been often used in the study of mother-infant interaction, may in fact limit the ability of the partners in the dyad to move in and out of synchrony and dissynchrony. Patterns of visual engagement, for example, might look different in the case of a mother and infant who were physically free to move together or apart. These data also illustrate the importance of context. Peaks of synchrony were often associated with achievement of a goal after a period of mild frustration. A research design which allowed for such occurences, such as a design incorporating free play, would provide a view of how patterns of synchrony and dissynchrony occur in normal interaction.

APPENDIX A.

Table 1. OVERVIEW OF THE DATA.

Videotaped Observations of 7 Mother-Infant Pairs.

Child	a. Time Observed	b. Time Spent Touching	c. % of Time spent Touching (a/b)	d. Number of Touching Events	e. Mean Duration of Events	f. Range of Event	g. Events/ Minute
Sal:	1868"	790"	42%	11	72"	2-355"	.35
Tom:	6202"	1463"	24%	65	23"	1-186"	.63
Piq:	1440"	161"	11%	3	54"	2-146"	.13
Lea:	1711"	208"	12%	7	30"	1-128"	.25
Ken:	1172"	113"	10%	9	13"	1-58"	.46
Ned:	1829"	45"	3%	9	5"	1-20"	.30
Ann:	4640"	633"	14%	16	40"	3-325"	.21
x:			16%		34"		.33
sd:			13%		23"		.18

APPENDIX B.

INDEX OF OBSERVATIONS

APPENDIX C.

OBSERVATION FORMAT

1. Duration of Event

2. Behavioral Context:

   a. Control/Instrumental Touch (Caretaking, Restraint, Limit-Setting)
   b. Soothing/Comforting
   c. Assistance
   d. Physical Support
   e. Organizing of Attention
   f. Teaching (such as showing baby how to pat a baby by moving its hand)
   g. Contact-Maintaining (pat, stroke, cuddle)
   h. Play
   i. Separation (such as mother guiding child away)
   j. Conflict/Struggle (Only a low level was observed.)
   k. Exploration of the other's body
   l. Other

3. Form of Contact

   a. Holding

      1. Full Bodily Support of Child by Mother
      2. Child sits or stands in Mother's lap, Mother Holding Child
      3. Child Leaning on Mother, Mother Holding Child

   b. Limiting Touch: Moving Child or Restricting Movement

      1. Moving Child by Hands/Body
      2. Holding Child by Limb/Body/Clothing

   c. Unrestrictive Touch

      1. Caretaking, noncontrolling (e.g., fixing hair)
      2. Contact-Touch (Touching for its own sake or for pleasure, such as cuddling, patting, and stroking)
      3. Attention-Directing Touch
      4. Support without Restriction of Movement

4. Relative Position of Mother and Child

   a. Face-to-face (Full gaze/ Averted Gaze)
   b. Side-by-Side
   c. Back to Front (usually the child's back to the mother's front)

5. Essential Aspects of Touching

   a. Mother's Grasp (Fingers/ Partial Grasp/ Full Grasp)
   b. Location of Touch on Child's Body
   c. Extent of Body Touched

6. Interactional Aspects of Touch

   a. Affect observed in mother and child (Characterized using Resch and Bassin categories. See Resch & Bassin, unpubl.)

      1. Interest/Curiosity
      2. Fascination
      3. Enjoyment/Cheer
      4. Thrill
      5. Surprise/Startle
      6. Wary/En Garde
      7. Glum/Diffuse Distress
      8. Thwarted/Frustrated
      9. Anger/Focal Distress

   b. Initiation, termination, or modification of interaction

7. Attention

   a. Focussed vs. Divided Attention for Mother/Child

8. Self-Stimulation by Child During Touch (Finger-Sucking, etc.)

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