

## Chapter 7

# The Sense of a Subjective Self: II. Affect Attunement

### *The Problem of Sharing Affective States*

The sharing of affective states is the most pervasive and clinically germane feature of intersubjective relatedness. This is especially true when the infant first enters this domain. Interaffectivity is mainly what is meant when clinicians speak of parental "mirroring" and "empathic responsiveness." Despite the importance of these events, it is not at all clear how they work. What are the acts and processes that let other people know that you are feeling something very like what they are feeling? How can you get "inside of" other people's subjective experience and then let them know that you have arrived there, without using words? After all, the infants we are talking about are only between nine and fifteen months old.

Imitation immediately comes to mind as a possible way one might show this. The mother might imitate the infant's facial expressions and gestures, and the baby would see her doing this. The problem with this solution is that the infant could only tell from the mother's

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imitation that mother got what the infant *did*; she would have reproduced the same overt behaviors, but she need not have had any similar inner experience. There is no reason why the infant should make the further assumption that mother also experienced the same feeling state that gave rise to the overt behavior.

For there to be an intersubjective exchange about affect, then, strict imitation alone won't do. In fact, several processes must take place. First, the parent must be able to read the infant's feeling state from the infant's overt behavior. Second, the parent must perform some behavior that is not a strict imitation but nonetheless corresponds in some way to the infant's overt behavior. Third, the infant must be able to read this corresponding parental response as having to do with the infant's own original feeling experience and not just imitating the infant's behavior. It is only in the presence of these three conditions that feeling states within one person can be knowable to another and that they can both sense, without using language, that the transaction has occurred.

To accomplish this transaction the mother must go beyond true imitations, which have been an enormous and important part of her social repertoire during the first six months or so of the infant's life (Moss 1973; Beebe 1973; Stern 1974b, 1977; Field 1977; Brazelton et al. 1979; Papoušek and Papoušek 1979; Trevarthan 1979; Francis et al. 1981; Uzgiris 1981, 1984; Kaye 1982; Malatesta and Izard 1982; Malatesta and Haviland 1983). Most of these investigators have described in detail how caregivers and infants mutually create the chains and sequences of reciprocal behaviors that make up social dialogues during the infant's first nine months. The Papoušeks describe this process in the vocal—in fact, musical—domain in great detail (1981). What is striking in these descriptions is that the mother is almost always working within the same modality as the infant. And in the leadings, followings, highlightings, and elaborations that make up her turn in the dialogue, she is generally performing close or loose imitations of the infant's immediate behavior. If the infant vocalizes, the mother vocalizes back. Similarly, if the infant makes a face, the mother makes a face. However, the dialogue does not remain a stereotypic boring sequence of repeats, back and forth, because the mother is constantly introducing modifying imitations (Kaye 1979; Uzgiris 1984) or providing a theme-and-variation format with slight changes in her contribution at each dialogic turn;

for example, her vocalization may be slightly different each time (Stern 1977).

When the infant is around nine months old, however, one begins to see the mother add a new dimension to her imitation-like behavior, a dimension that appears to be geared to the infant's new status as a potentially intersubjective partner. (It is not clear how mothers know this change has occurred in the infant; it seems to be part of their intuitive parental sense.) She begins to expand her behavior beyond true imitation into a new category of behavior we will call *affect attunement*.

The phenomenon of affect attunement is best shown by examples (Stern 1985). Affect attunement is often so embedded in other behaviors that relatively pure examples are hard to find, but the first five examples that follow are relatively unencumbered by other goings-on.

A nine-month-old girl becomes very excited about a toy and reaches for it. As she grabs it, she lets out an exuberant "aaah!" and looks at her mother. Her mother looks back, scrunches up her shoulders, and performs a terrific shimmy with her upper body, like a go-go dancer. The shimmy lasts only about as long as her daughter's "aaah!" but is equally excited, joyful, and intense.

A nine-month-old boy bangs his hand on a soft toy, at first in some anger but gradually with pleasure, exuberance, and humor. He sets up a steady rhythm. Mother falls into his rhythm and says, "kaaaa-bam, kaaaa-bam," the "bam" falling on the stroke and the "kaaaa" riding with the preparatory upswing and the suspenseful holding of his arm aloft before it falls.

An eight-and-one-half-month-old boy reaches for a toy just beyond reach. Silently he stretches toward it, leaning and extending arms and fingers out fully. Still short of the toy, he tenses his body to squeeze out the extra inch he needs to reach it. At that moment, his mother says, "uuuuuh . . . uuuuuuh!" with a crescendo of vocal effort, the expiration of air pushing against her tensed torso. The mother's accelerating vocal-respiratory effort matches the infant's accelerating physical effort.

A ten-month-old girl accomplishes an amusing routine with mother and then looks at her. The girl opens up her face (her mouth opens, her eyes widen, her eyebrows rise) and then closes it back, in a series of changes whose contour can be represented by a smooth arch of changes whose contour can be represented by a pitch line (see *Figure 1*). Mother responds by intoning "Yeah," with a pitch line that rises and falls as the volume crescendos and decrescendos:

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"Yeah." The mother's prosodic contour has matched the child's facial-kinetic contour.

A nine-month-old boy is sitting facing his mother. He has a rattle in his hand and is shaking it up and down with a display of interest and mild amusement. As mother watches, she begins to nod her head up and down, keeping a tight beat with her son's arm motions.

More often the attunement is so embedded in other actions and purposes that it is partially masked, as in the next example:

A ten-month-old girl finally gets a piece in a jig saw puzzle. She looks toward her mother, throws her head up in the air, and with a forceful arm flap raises herself partly off the ground in a flurry of exuberance. The mother says "YES, thata girl!" The "YES" is intoned with much stress. It has an explosive rise that echoes the girl's fling of gesture and posture.

One could easily argue that the "YES, thata girl!" functions as a routine response in the form of a positive reinforcer, and it certainly does do so. But why does the mother not just say "Yes, thata girl?" Why does she need to add the intense intonation to "YES" that vocally matches the child's gestures? The "YES," I suggest, is an attunement embedded within a routine response.

The embedding of attunements is so common and most often so subtle that unless one is looking for it, or asking why any behavior is being performed exactly the way it is, the attunements will pass unnoticed (except, of course, that one will gather from them what we imagine to be "really" going on clinically). It is the embedded attunements that give much of the impression of the quality of the relationship.

Attunements have the following characteristics, which makes them ideal for accomplishing the intersubjective sharing of affect:

1. They give the impression that a kind of imitation has occurred. There is no faithful rendering of the infant's overt behavior, but some form of matching is going on.
2. The matching is largely cross-modal. That is, the channel or modality of expression used by the mother to match the infant's behavior is different from the channel or modality used by the infant. In the first example, the intensity level and duration of the girl's voice is matched by the mother's body movements. In the second example, features of the boy's arm movements are matched by features of the mother's voice.

3. What is being matched is not the other person's behavior *per se*, but rather some aspect of the behavior that reflects the person's feeling state. The ultimate reference for the match appears to be the feeling state (inferred or directly apprehended), not the external behavioral event. Thus the match appears to occur between the expressions of inner state. These expressions can differ in mode or form, but they are to some extent interchangeable as manifestations of a single, recognizable internal state. We appear to be dealing with behavior as expression rather than as sign or symbol, and the vehicles of transfer are metaphor and analogue.<sup>1</sup>

Affect attunement, then, is the performance of behaviors that express the quality of feeling of a shared affect state without imitating the exact behavioral expression of the inner state. If we could demonstrate subjective affect-sharing only with true imitations, we would be limited to flurries of rampant imitation. Our affectively responsive behavior would look ludicrous, maybe even robot-like.

The reason attunement behaviors are so important as separate phenomena is that true imitation does not permit the partners to refer to the internal state. It maintains the focus of attention upon the forms of the external behaviors. Attunement behaviors, on the other hand, recast the event and shift the focus of attention to what is behind the behavior, to the quality of feeling that is being shared. It is for the same reasons that imitation is the predominant way to teach external forms and attunement the predominant way to communicate with or indicate sharing of internal states. Imitation renders form; attunement renders feeling. In actuality, however, there does not appear to be a true dichotomy between attunement and imitation; rather, they seem to occupy two ends of a spectrum.

#### *Alternative Conceptualizations*

One might well ask why I call this phenomenon affect attunement when there already exist several terms to encompass it. One reason is that these terms and their underlying concepts fail to capture the

1. Strictly speaking one could call this the imitation of selected features, in that one or two features of a behavior are chosen to be imitated while most other features are not so selected. The reason we have not chosen this term is that the imitated features are recast in a different form, creating the impression of referencing the inner state rather than the overt behavior.

phenomenon adequately. While the mother's attunings are often not even reasonably faithful imitations, the virtue of a loose definition of imitation can be argued. Kaye (1979) has pointed out that "modifying imitations" are intended to just miss the mark in order to maximize or minimize aspects of the original behavior. And Uzgritis refers to essentially the same issues with the terms "imitation" and "matching" (1984). Nonetheless, there is a limit beyond which fidelity cannot be stretched if "imitation" is still to keep its usual meaning.

A second problem is that of the representations necessary for imitation. "Deferred imitation," as meant by Piaget (1954), requires the capacity for acting on the basis of an internal representation of the original. The reproduction (or imitation) is guided by the blueprint provided by the internal representation. Piaget had in mind the *observed behaviors* as the referent which is represented. The nature of such representations is well conceptualized. But if the referent is the feeling state, how do we conceptualize its representation so that it can act as a blueprint? We are going to require a different notion of the nature of the representation that is operating, namely a representation of the feeling state, not its overt behavioral manifestation.

The terms "affect matching" or "affect contagion" have a similar appeal. These processes refer to the automatic induction of an affect in one person from seeing or hearing someone else's affect display. This process may well be a basic biological tendency among highly evolved social species, which becomes perfected in man (Malatesta and Izard 1982). The earliest affect contagion that has been demonstrated involves the human distress cry. Wolff (1969) found that two-month-old infants showed "infectious crying" when they heard tape recordings of their own distress cries. Simmer (1971) and Sagi and Hoffman (1976) showed that contagious crying occurred in newborns. Newborns cried more to infant cries in general than to equally loud artificially produced sounds. Similarly, the contagious properties of the smile have been well documented in infancy, even though mechanisms for it may shift during development.

Affect matching with its probable basis in "motor mimicry" (Lipps 1906) cannot alone explain affect attunement, although it may well provide one of the underlying mechanisms on which that phenomenon is founded. By itself, affect matching, like imitation, explains

only a reproduction of the original. It cannot account for the phenomenon of responding in different modes or with different forms of behavior, with the internal state as the referent.

"Intersubjectivity" as articulated by Trevarthan (1977, 1978, 1979, 1980) approaches the essence of the problem, although from a different direction. It concerns the mutual sharing of psychic states, but it refers mainly to intentions and motives rather than to qualities of feeling or affects. Its major concern is intentionality, not interaffectivity. Intersubjectivity is an entirely adequate term and concept, but it is too inclusive for our purposes. Affect attunement is a particular form of intersubjectivity that requires some processes that are unique to it.

"Mirroring" and "echoing" represent the clinical terms and concepts that come closest to affect attunement. As terms, both run into the problem of fidelity to the original. "Mirroring" has the disadvantage of suggesting complete temporal synchrony. "Echoing," taken literally, at least avoids the temporal constraint. In spite of these semantic limitations, however, these concepts represent attempts to grapple with the issue of one person reflecting another's inner state. In this important respect, unlike imitation or contagion, they are appropriately concerned with the subjective state rather than the manifest behavior.

This meaning of reflecting inner state has been used mostly in clinical theories (Mahler et al. 1975; Kohut 1977; Laean 1977), which have noted that reflecting back an infant's feeling state is important to the infant's developing knowledge of his or her own affectivity and sense of self. When used in this sense, however, "mirroring" implies that the mother is helping to create something within the infant that was only dimly or partially there until her reflection acted somehow to solidify its existence. This concept goes far beyond just participating in another's subjective experience. It involves changing the other by providing something the other did not have before or, if it was present, by consolidating it.

A second problem with mirroring as a term is the inconsistency and overinclusiveness of its usage. In clinical writings, it sometimes refers to the behavior itself—that is, to true imitation, a literal reflecting back, in the domain of core-relatedness—and sometimes to the sharing or alignment of internal states—in our terms, affect attunement in the domain of intersubjective relatedness. At still other

times, it refers to verbal reinforcements or consensual validation at the level of verbal relatedness. "Mirroring" is thus commonly used to embrace three different processes. Moreover, it is not clear which subjective states are to be included in mirroring affects—intentions; motives? beliefs? ego functions? In short, while mirroring has focused upon the essence of the problem, the indeterminate usage has blurred what appear to be real differences in mechanism, form, and function.

Finally, there is "empathy." Is attunement sufficiently close to what is generally meant by empathy? No. The evidence indicates that attunements occur largely out of awareness and almost automatically. Empathy, on the other hand, involves the mediation of cognitive processes. What is generally called empathy consists of at least four distinct and probably sequential processes: (1) the resonance of feeling state; (2) the abstraction of empathic knowledge from the experience of emotional resonance; (3) the integration of abstracted empathic knowledge into an empathic response; and (4) a transient role identification. Cognitive processes such as these involved in the second and third events are crucial to empathy (Schaffer 1968; Hoffman 1978; Ornstein 1979; Basch 1983; Demos 1984). (Cognitive imaginings of what it must be like to be another person, however, are nothing more than elaborated acts of role taking and not empathy, unless they have been ignited by at least a spark of emotional resonance.) Affect attunement, then, shares with empathy the initial process of emotional resonance (Hoffman 1978); neither can occur without it. The work of many psychoanalytic thinkers concurs on this formulation (Basch 1983). But while affect attunement, like empathy, starts with an emotional resonance, it does something different with it. Attunement takes the experience of emotional resonance and automatically recasts that experience into another form of expression. Attunement thus need not proceed towards empathic knowledge or response. Attunement is a distinct form of affective transaction in its own right.

*The Evidence for Attunement*

What evidence exists for the phenomenon of attunement, and what kind of evidence could be developed to demonstrate it? The problem of demonstration boils down to this: the existence of an attunement is at first glance a clinical impression, perhaps an intuition. To operationalize this impression, it is necessary to identify those aspects of a person's behavior that could be matched without actually imitating them. Stern et al. (in press) reasoned that there were three general features of a behavior that could be matched (and thereby form the basis of an attunement) without rendering an imitation. These are intensity, timing, and shape. These three dimensions were then broken down into six more specific types of match:

1. *Absolute intensity.* The level of intensity of the mother's behavior is the same as that of the infant's, irrespective of the mode or form of the behavior. For instance, the loudness of a mother's vocalization might match the force of an abrupt arm movement performed by the infant.
2. *Intensity contour.* The changes of intensity over time are matched. The second example on page 140 provides a good instance of this type of match. The mother's vocal effort and the infant's physical effort both showed an acceleration in intensity, followed suddenly by an even quicker intensity deceleration phase.
3. *Temporal beat.* A regular pulsation in time is matched. The fifth example, on page 141, is a good example of a temporal beat match. The nodding of the mother's head and the infant's gesture conform to the same beat.
4. *Rhythm.* A pattern of pulsations of unequal stress is matched.
5. *Duration.* The time span of the behavior is matched. If the mother's and infant's behaviors last about the same time, a duration match has occurred. A duration match by itself is not considered to constitute a sufficient criterion for an attunement, however, because too many non-attunement, infant/mother response chains show duration matching.
6. *Shape.* Some spatial feature of a behavior that can be abstracted and rendered in a different act is matched. The fifth example, on page 141, provides an instance. The mother has borrowed the vertical shape of the infant's up-down arm motion and adapted it in her head motion. Shape does not mean the same form; that would be imitation.

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The second step in examining the nature of affect attunements, once matching criteria were established, was to enlist the collaboration of mothers in answering a series of questions about their matchings. Why did she do what she did, the way she did it and when she did it? What did she think the baby felt at the moment that . . . ? Was she aware of her own behavior when she . . . ? What did she wish to accomplish . . . ?

Accordingly, mothers were first asked to play with their infants as they normally would at home. The play session took place in a pleasant observation room filled with some age-appropriate toys. The mother and infant were left alone for ten to fifteen minutes while their interaction was videotaped. Immediately afterwards, the mother and the experimenters watched a replay of the taped interaction. Many questions were then asked. The experimenters made every attempt to create a collaborative, easy, working atmosphere with the mothers, rather than an inquisitorial or judgmental one. Most mothers felt that an alliance had been forged with the researchers. This "research-therapeutic alliance" is crucial to this kind of joint inquiry.

An important issue in the process was when to stop the taped flow of interaction and ask the questions. Entry criteria were set up to identify points at which to jump into the stream of interaction. The first such criterion was that the baby had made some affective expression—facial, vocal, gestural, or postural. The second was that the mother had responded in some observable way. And the third was that the baby had seen, heard, or felt her response. When an event meeting these criteria was viewed, the videotape was stopped and the questions were asked. The taped episode was replayed as often as necessary. The results of the experiments with ten mothers as participant-researchers and their infants aged eight to twelve months are reported elsewhere in detail (Stern et al., in press). The major findings that have relevance to the present discussion are summarized here.

1. In response to an infant expression of affect, maternal attunements were the most common maternal response (48 percent), followed by comments (33 percent), and imitations (19 percent). During play interactions attunements occurred at a rate of one every sixty-five seconds.

2. Most attunements occurred across sensory modes. If the infant's expression was vocal, the mother's attunement was likely to be gestural or facial, and vice versa. In 39 percent of the instances of attunement, the mothers used entirely different modalities from those used by the infant (cross-modal attunement). In 48 percent of the cases, the mothers used some modalities that were the same as those used by the infant (intramodal attunement) and some that were different. Thus 87 percent of the time, the mothers' attunements were partially, if not wholly, cross-modal.
3. Of the three aspects of behavior—intensity, timing, and shape—that a mother can use to accomplish an attunement, intensity matches were the most common, followed by timing matches and last by shape matches. In the majority of cases, more than one aspect of behavior was simultaneously matched. For instance, when the infant's up-and-down hand gesture was matched by the mother's head nodding up and down, both beat and shape were being matched. The percentages of all attunements that represented matchings of the various aspects are: intensity contour, 81 percent; duration, 69 percent; absolute intensity, 61 percent; shape, 47 percent; beat, 13 percent; and rhythm, 11 percent.
4. The largest single reason that mothers gave (or that we inferred) for performing an attunement was "to be with" the infant, "to share," "to participate in," "to join in." We have called these functions *interpersonal communion*. This group of reasons stands in contrast to the other kinds of reasons given: to respond, to jazz the baby up or to quiet, to restructure the interaction, to reinforce, to engage in a standard game. This later group can be lumped together as serving the function of communication rather than communion. Communication generally means to exchange or transmit information with the attempt to alter another's belief or action system. During many of these attunements the mother is doing none of these things. Communion means to share in another's experience with no attempt to change what that person is doing or believing. This idea captures far better the mother's behavior as seen by experimenters and by the mothers themselves.
5. Several variations on attunements occurred. In addition to *communing attunements*, true attunements in which the mother tried to match exactly the infant's internal state for the purpose of "being with" the baby, there were misattunements, which fell into two types. In *purposeful misattunement*, the mother "intentionally" over- or under-matched the infant's intensity, timing, or behavioral shape. The purpose of these misattunements was usually to increase or decrease the baby's level of activity or affect. The mother "slipped inside of" the infant's feeling state far enough to capture it, but she then misexpressed it enough to alter the infant's behavior but not enough

to break the sense of an attunement in process. Such purposeful misattunements were called *timing*. There were also *nonpurposeful misattunements*. Either the mother incorrectly identified, to some extent, the quality and/or quantity of the infant's feeling state, or she was unable to find in herself the same internal state. These misattunements we called *true misattunements*.<sup>2</sup>

6. When mothers were shown the taped replay of their attunements, they judged themselves to have been entirely unaware of their behavior at the time of occurrence in 24 percent of cases; only partly aware of their behavior in 43 percent of cases; and fully aware of their behavior in 32 percent of cases.

Even in the 32 percent of cases where the mother said she was fully aware of her behavior, she was often referring to the desired consequences of her behavior more than to what she actually did. Thus the attunement *process* itself occurs largely unawares.

It is easy enough to determine experimentally that tunings and misattunements influence the infant: they usually result in some alteration or interruption of ongoing infant behavior. That is their purpose, and the result can be readily gauged. The situation with communing attunements is different. Most often after the mother has made such an attunement, the infant acts as if nothing special has happened. The infant's activity continues uninterrupted, and we are left with no evidence, only speculation, that the fact of attunement has "gotten in," taken hold, and had some psychic consequence. To get underneath this still surface, we chose the method of perturbing ongoing interactions and seeing what happens.

The approach of creating defined perturbations in naturalistic or seminaturalistic interaction is well established in infancy research. For example, the "still-face" procedure (Tronick et al. 1978) asks a mother or father to go "still-faced"—impassive and expressionless—in the middle of an interaction, creating a perturbation in the expected flow. Infants by three months of age react with mild upset and social withdrawal, alternating with attempts to re-engage the impassive partner. This kind of perturbation can be used with any and all parent/infant pairs. The perturbations of attunement, however, had to be tailored to a specific pair and aimed at a previously

2. The obvious clinical import of the characteristic and selective use of attunements, tuning, and misattunements in different affective contexts will be addressed in chapter 9.

identified and likely-to-recur attunement episode. No two pairs presented the same opportunity.

For each pair, the specific attunement episode chosen for perturbation was identified while the mother and researchers watched the replay of the videorecording. After discussing the structure of behaviors that made up the attunement episode, the researchers instructed the mothers in how to perturb the structure. The mothers then returned to the observation room, and when the appropriate context for the expectable attunement behavior arose, they performed the planned perturbation. Two examples will serve to illustrate the results.

In the videotape of the initial play period, a nine-month-old infant is seen crawling away from his mother and over to a new toy. While on his stomach, he grabs the toy and begins to bang and flail with it happily. His play is animated, as judged by his movements, breathing, and vocalizations. Mother then approaches him from behind, out of sight, and puts her hand on his bottom and gives it an animated jiggle side to side. The speed and intensity of her jiggle appear to match well the intensity and rate of the infant's arm movements and vocalizations, qualifying this as an attunement. The infant's response to her attunement is—nothing! He simply continues his play without missing a beat. Her jiggle has no overt effect, as though she had never acted. This attunement episode was fairly characteristic of this pair. The infant wandered from her and became involved in another toy, and she leaned over and jiggled his bottom, his leg, or his foot. This sequence was repeated several times.

For the first perturbation, the mother was instructed to do exactly the same as always, except that now she was purposely to "misjudge" her baby's level of joyful animation, to pretend that the baby was somewhat less excited than he appeared to be, and to jiggle accordingly. When the mother did jiggle somewhat more slowly and less intensely than she truly judged would make a good match, the baby quickly stopped playing and looked around at her, as if to say "What's going on?" This procedure was repeated, with the same result.

The second perturbation was in the opposite direction. The mother was to pretend that her baby was at a higher level of joyful animation and to jiggle accordingly. The results were the same: the infant noticed the discrepancy and stopped. The mother was then asked to

go back to jiggling appropriately, and again the infant did *not* respond.<sup>3</sup>

One could argue that the jiggle, when performed within some band of speed/intensity, is simply a form of reinforcement, rather than a signal. There is no problem with this formulation except that it does not account for the fact that the acceptable band is determined by the relationship between the infant's and the mother's speed and level of intensity, not by the absolute level on the mother's part. And there is no problem with attunements also serving reinforcing functions. But simple reinforcement cannot explain away attunement. The two phenomena are undoubtedly embedded one within the other and serve different functions in the developing relationship. Interviews with the mother afterwards confirmed this dual function. She said that she did the regular attunement "to get into the playing with him," but she also said that she figured, in retrospect, that it probably "encouraged" him to continue.

In another example, the initial videotape shows an eleven-month-old going after an object with determination and excitement. He gets it and brings it to his mouth with much excitement and body tension. Mother says, "Yeah, ya like that." The infant does not respond to her utterance. When the mother was asked to over-shoot or under-shoot the pitch contouring, rate, and stress patterning of her standard utterance, compared with the perceived excitement and tension of her infant, the infant took notice and looked at her, as if for further clarification.

Many more such individualized perturbations have been performed, all indicating that the infant does indeed have some sense of the extent of matching. Closeness of match, in itself, is an expectation under some circumstances, and its violation is meaningful.

It is clear that interpersonal communion, as created by attunement, will play an important role in the infant's coming to recognize that internal feeling states are forms of human experience that are shareable with other humans. The converse is also true: feeling states that are never attuned to will be experienced only alone, isolated

3. Note that each time a perturbation was attempted the infant was at a somewhat different level of excitation and the mother had to adjust her "misjudgment" to his current level. It is also notable that some mothers found misjudgments hard to execute. One said that it is like trying to pat your head and rub your stomach at the same time.

from the interpersonal context of shareable experience. What is at stake here is nothing less than the shape of and extent of the shareable inner universe.

### *Underlying Mechanisms for Attunement*

For attunement to work, different behavioral expressions occurring in different forms and in different sensory modalities must somehow be interchangeable. If a certain gesture by the mother is to be "correspondent" with a certain kind of vocal exclamation by the infant, the two expressions must share some common currency that permits them to be transferred from one modality or form to another. That common currency consists of amodal properties.

There are some qualities or properties that are held in common by most or all of the modalities of perception. These include intensity, shape, time, motion, and number. Such qualities of perception can be abstracted by any sensory mode from the invariant properties of the stimulus world and then translated into other modalities of perception. For instance, a rhythm, such as "long short" (— — — —), can be delivered in or abstracted from sight, audition, smell, touch, or taste. For this to occur, the rhythm must at some point exist in the mind in a form that is not inextricably bound to one particular way of perceiving it but is rather sufficiently abstract to be transportable across modalities. It is the existence of these abstract representations of amodal properties that permits us to experience a perceptually unified world.

From what has gone before, it is clear that infants can perceive the world amodally from early on and that they get better at it during maturation. This position has been strongly put forth by developmentalists such as Bower (1974), who states that from the earliest days of life, the infant forms and acts upon abstract representations of qualities of perception.

The qualities of experience that lend themselves to intermodal fluency, which will be of paramount interest to us here, are the ones that were determined to be the best criteria for defining attunements—namely, intensity, time, and shape. This intermodal fluency is the

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phenomenon in want of an explanatory mechanism. What, then, is the evidence that infants can perceive or experience intensity, time, and shape amodally?

#### INTENSITY

Level of intensity, as we have seen, was one of the qualities most frequently matched in designating attunements. Most often the match was between the intensity of an infant's physical behavior and the intensity of the mother's vocal behavior. Can an infant match levels of intensity across the visual and auditory modalities? Yes, and quite well, as indicated in the experiment described in chapter 3 in which three-week-old infants matched levels of loudness of sounds to levels of brightness of lights (Lewkowicz and Turkewitz 1980). The ability to perform audio-visual cross-modal matches of the absolute level of intensity appears to be a very early capacity.<sup>4</sup>

#### TIME

The temporal qualities of behavior were the second most commonly matched in performing attunements. Here too, as mentioned in chapter 3, infants appear to be well endowed with the capacity to match temporal patterns across modes. In fact, intensity level and timing may be the perceptual qualities that the infant is best able to represent modally, and at the earliest points in development.

#### SHAPE

Intensity and time are quantitative properties of stimulation or perception, in contrast to shape, which is qualitative. What is known about the infant's competence in the intermodal coordination of shape or configuration? The Meltzoff and Borton (1979) experiment described on pages 47–48 is an example par excellence of the transfer of the shape of a static object from the tactile mode to the visual mode. After this demonstration, it was logical to ask whether correspondences in kinetic shapes could also be made, and whether correspondences would also occur across vision and audition as well as across vision and touch. After all, most human behavior consists

4. This intermodal capacity for matching relative level of intensity does not directly address the capacity for matching intensity contours, the profiles of change in intensity over time. This was the other intensity criterion for attunement—in fact, the most common type of match. An intensity contour also involves time and is in some ways closer to shape as a quality than to intensity as a quantity.



of kinetic shapes—that is, configurations that change in time—and vocalizations are one of the most pervasive kinetic shapes involved in attunements. As the experiments of Mackain et al. (1983) and Kuhl and Meltzoff (1982) have shown, infants should have no trouble at all in making these cross-modal transformations (see chapter 3).

### *The Unity of the Senses*

It thus appears that shape, intensity, and time can all be perceived amodally. And, indeed, philosophy, psychology, and art have a long history of designating shape, time, and intensity to be amodal qualities of experience (in psychological terms) or primary qualities of experience (in philosophical terms) (see Marks 1978). These issues have a long history, because what is at stake is the unity of the senses, which ultimately boils down to the knowledge or experience that the world as seen is the same world that is heard or felt.

Aristotle first postulated a doctrine of sensory correspondence, or a doctrine of the unity of the senses. His sixth sense, the common sense, was the sense that could apperceive the qualities of sensation that are primary (that is, amodal) in that they do not belong exclusively to any one sense alone, as color belongs to vision, but are shared by all the senses. Aristotle's list of primary qualities that could be extracted from any modality, represented in abstract form, and translated among all sense modes included intensity, motion, rest, unity, form, and number. Philosophers since have argued about which attributes of perception meet the requirements of primary qualities, but intensity, form, and time are usually included.

Psychologists were probably first drawn to the issue of the unity of the senses by the phenomenon of synesthesia, in which stimulation in a single sense evokes sensations that belong to a different modality of stimulation. The most common synesthesia is "colored hearing." Particular sounds, such as a trumpet, produce the visual image of a particular color, perhaps red, along with the auditory percept (see Marks [1978] for a review). The existence of synesthesia was only part of the allure of unity of the senses, however. The issue of

intramodal equivalences or correspondences has always been of interest to students of perception, and the developmental psychologists have recently picked up the age-old trail. The problem is subsumed under what Marks calls the Doctrine of Equivalent Information, which states that different senses can inform about the same features of the external world. Much of the theoretical work of the Gibsons (1959, 1969, 1979), Piaget (1954), T. Bower (1974), and others addresses this issue.

Therapists are so familiar with this phenomenon that it is taken for granted as a way to communicate feelings about important perceptions. When a patient says, "I was so anxious and uptight about how she would greet me, but as soon as she spoke it was like the sun came out—I melted," we understand directly. How could most metaphors work without an underlying capacity for the transposition of amodal information?

Artists, especially poets, have taken the unity of the senses for granted. Most poetry could not work without the tacit assumption that cross-sensory analogies and metaphors are immediately apparent to everyone. Certain poets, such as the French Symbolists during the nineteenth century, elevated the fact of the cross-modal equivalence of information to a guiding principle of the poetic process.

There are odors fresh as the skin of an infant,  
Sweet as flutes, green as any grass,  
And others, corrupt, rich and triumphant.  
(Baudelaire, *Correspondences*, 1857)

In just three lines, Baudelaire asks us to relate smells to experiences in the domains of touch, sound, color, sensuality, finance, and power. A similar preoccupation has visited the other arts.<sup>5</sup>

5. Around the turn of the twentieth century, visual artists and musicians engaged in innumerable experiments at symphonic light shows, using novel instruments such as color organs to express in one medium or perceptual modality the qualities rendered in another. Such cross-sensory attempts were also conducted in traditional media; an example is Mussorgsky's *Pictures at an Exhibition*.

When sound film became possible, the opportunities for intermingling and integrating the qualities of sound and vision became obvious and irresistible for pioneers in the new medium. Sergei Eisenstein's attempts to integrate the two media are perhaps best known because of his extensive writing about film-making (1957) and the success of his genius in intramodal integration. In his classic film *Alexander Nevsky*, Eisenstein worked closely with Prokofiev, the composer of the score. Together they matched the visual structure of each film frame with the auditory structure of the music being played during that shot; the battle scene is perhaps still the most careful and painstaking artistic exploration of the integration of sight and sound

The point of this discussion about the unity of the senses is that the capacities for identifying cross-modal equivalences that make for a perceptually unified world are the same capacities that permit the mother and infant to engage in affect attunement to achieve affective intersubjectivity.

### *What Inner State is Being Attuned to?*

It appears that both forms of affects—discrete categorical affects such as sadness and joy as well as vitality affects such as explosions and fading—are attuned to. In fact, most attunements seem to occur with the vitality affects.

In chapter 3, we identified vitality affects as those dynamic, kinetic qualities of feeling that distinguish animate from inanimate and that correspond to the momentary changes in feeling states involved in the organic processes of being alive. We experience vitality affects as dynamic shifts or patterned changes within ourselves or others. One of the reasons we went to such efforts there to establish vitality affects as entities in their own right, distinct from what is usually meant by activation as well as from categories of affect, is that now they become essential to an understanding of attunement.

During an average mother-infant interaction, discrete affect displays occur only occasionally—perhaps every thirty to ninety seconds. Since this is so, affective tracking or attuning with another could not occur as a continuous process if it were limited to categorical affects. One cannot wait around for a discrete categorical affect display, such as a surprise expression, to occur in order to re-establish attunement. Attunement feels more like an unbroken process. It cannot await

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ever attempted. The works of Walt Disney achieve their various effects through the same impact of sound-sight coordination. And dance is the ultimate example—in fact, the prototype.

At a more mundane level, the pervasiveness of our familiarity with the unity of the senses is seen in many games. One variant of the parlor game of Twenty Questions depends upon this familiarity. The person who is "it," thinks of some person. Everyone else has to guess that person's identity by asking for intra- and cross-modal correspondences; for example, "If the person were a vegetable, what vegetable would he be?" "What kind of drink would she be?" "What kind of sound?" "What smell?" "What kind of geometric shape?" "What surface would he feel like?" and so on.

### THE SENSE OF A SUBJECTIVE SELF: II.

discrete affect eruptions; it must be able to work with virtually all behavior. And that is one of the great advantages of the vitality affects. They are manifest in all behavior and can thus be an almost omnipresent subject of attunement. They concern *how* a behavior, *any* behavior, all behavior is performed, not *what* behavior is performed.

Vitality affects therefore must be added to affect categories as one of the kinds of subjective inner states that can be referenced in acts of attunement. Vitality is ideally suited to be the subject of attunements, because it is composed of the amodal qualities of intensity and time and because it resides in virtually any behavior one can perform and thus provide a continuously present (though changing) subject for attunement. Attunements can be made with the inner quality of feeling of how an infant reaches for a toy, holds a block, kicks a foot, or listens to a sound. Tracking and attuning with vitality affects permit one human to "be with" another in the sense of sharing likely inner experiences on an almost continuous basis. This is exactly our experience of feeling-connectedness, of being in attunement with another. It feels like an unbroken line. It seeks out the activation contour that is momentarily going on in any and every behavior and uses that contour to keep the thread of communion unbroken.

### *Communicating Vitality Affects: Art and Behavior*

Both categorical and vitality affects, then, are the subject matter for attunement. One can imagine how a categorical affect display such as sadness, once seen, is directly felt by the viewer. Evolution and experience have teamed up to make that transposition of feeling from one to another comprehensible. But how and why can we automatically make these transpositions with vitality affects? We have identified time-intensity contours as one of the salient perceptual qualities that undergo the transformation and the way in which this process relies on capacities for amodal perception. But we still have not fully answered how we get from perceptions of others to feelings in ourselves, when there are no specific brewed programs operating

as there appear to be for the discrete categorical affects.

The problem can be restated as follows. We tend automatically to transpose perceptual qualities into feeling qualities, particularly when the qualities belong to another person's behavior. For instance, we may gather from someone's arm gesture the perceptual qualities of rapid acceleration, speed, and fullness of display. But we will *not* experience the gesture in terms of the perceptual qualities of timing, intensity, and shape; we will experience it directly as "forceful"—that is, in terms of a vitality affect.

How, then, do we get from intensity, timing, and shape to "forcefulness"? This is the question that lies at the heart of understanding one aspect of how art works, and perhaps a look at how the question has been approached in the domain of art may be helpful in understanding it in the domain of behavior.

Suzanne Langer (1967) has proposed a route for getting from perception to feeling. She suggests that, in works of art, the organization of elements seems to present an aspect of felt life. The feeling that is presented is in fact an apparition, an illusion, a virtual feeling. For instance, a two-dimensional painting creates the virtual feeling of three-dimensional space. What is more, virtual space can have the virtual properties of vastness, distance, advancing, receding, and so on. In a similar fashion, sculpture, an unmoving volume, can present virtual feelings of kinetic volume: leanings, liftings, and soarings. Music as an actual physical temporal event is one dimensional and homogeneous in time, yet it presents virtual time—that is, time as lived or experienced, rushing, tripping, drawn out, or suspenseful. Dance as actual effortful movement and gesture presents virtual "realms of power, a play of powers made visible" (Ghosh 1979, p. 69): explosions and implusions, restraint, meanderings, and effortlessness.

Is it possible that the activation contours (intensity in time) perceived in another's overt behavior become a virtual vitality affect when experienced in the self?

Spontaneous behaviors include conventionalized elements such as the configurations (the smiles and weeping) of the discrete categorical affects. These are analogous to conventionalized representational forms or iconic elements in painting, such as the Madonna and Child, except that their shared import comes about because of biological ritualization (by force of evolution), not by cultural

convention, as in the case of the Madonna and Child.

The translation from perception to feeling in conventionalized forms (icons in art or discrete affect displays in spontaneous behavior) is the least interesting part of the problem, however. In both art and behavior, there is also the *rendering* of the conventional forms. In the case of the Madonna and Child, that might mean the exact treatment of the Madonna's robe and the background, how the colors contrast and harmonize, how the linear and planar tensions are resolved—in short, how the forms will be handled. This is the domain of style.<sup>6</sup> In spontaneous behavior, the counterpart to artistic style is the domain of vitality affects. As we have seen, these concern the manner in which conventionalized affect displays such as smiling and other highly fixed motor programs such as walking are performed. This is where the exact performance of the behavior, in terms of timing, intensity, and shape, can render multiple "stylistic" versions or vitality affects of the same sign, signal, or action.<sup>7</sup>

The translation, then, from perception to feeling in the case of style in art involves the transmutation from "veridical" perceptions (color harmonies, linear resolutions, and the like) into such virtual forms of feeling as calmness. The analogous translation from perception of another person's behavior to feelings involves the transmutation from the perception of timing, intensity, and shape via cross-modal fluency into felt vitality affects in ourselves. I am in no way making a case that art and spontaneous behavior are equivalent; I am simply pointing out some similarities that may be helpful in understanding how affect attunement works when the attunement is to a vitality affect.

6. In the manner in which the representational elements are rendered, a high degree of the conventionalization is a product of a particular historical, geographic, or cultural setting or even of momentary fashions. The same is true for behavior. Still, style and conventionalized form are distinguishable.

7. This is the area in which many of the dance or movement analysis pioneers have labored, for example, and which Kesterberg (1979) and Sossin (1979) have fruitfully applied to mother/infant interactions. A recent photography show (*Form and Emotion in Photography*, The Metropolitan Museum of Art, New York, March 1982) brought home the difference that vitality affects can make. Mark Berghash took six photographs of the same woman's face. He simply asked her to think about a subject and "get into it"; he then took a photograph. The six subjects were her mother, her father, her brother, her past self, her present self, her future self. Together, the six pictures were titled "Aspects of the True Self." In no photograph (except possibly one) did the woman display a recognizable or nameable categorical display; her face was largely neutral by behavioral display rules. But the "stylistic" differences spoke volumes. Each photograph was a captured vitality affect.

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OPTIONAL READING

A Secure Base

continue to be inaccessible. When there is anger, it will continue to be directed at inappropriate targets. Similarly anxiety will continue to be aroused by inappropriate situations and hostile behaviour be expected from inappropriate sources. The therapeutic task is therefore to help the patient discover what these events and experiences may have been so that the thoughts, feelings, and behaviour that the situations arouse, and that continue to be so troublesome, can be linked again to the situations that aroused them. Then the true targets of his yearning and anger and the true sources of his anxiety and fear will become plain. Not only will such discoveries show that his modes of cognition, feeling, and behaviour are far more intelligible, given the circumstances in which they originated, than they had seemed before but, once the patient has grasped how and why he is responding as he is, he will be in a position to reappraise his responses and, should he wish, to un-structure their radical restructuring. Since such reappraisal and restructuring can be achieved only by the patient himself, the emphasis in this formulation of the therapist's task is on helping the patient first to discover for himself what the relevant scenes and experiences probably were and secondly to spend time pondering on how they have continued to influence him. Only then will he be in a position to undertake the reorganization of his modes of construing the world, thinking about it, and acting in it which are called for.

The concepts of therapeutic process outlined here are similar to those described in much greater detail by others. Examples are publications by Peterfreund (1983) and by Guidano and Liotti (1983). Although the authors of these two books started their therapeutic work from radically different positions, namely traditional versions of psychoanalysis and of behaviour therapy respectively, the principles that now guide their work show a striking convergence. Similarly current forms of bereavement therapy, which focus on distressing events in the comparatively recent past, are found to be based on the very same principles, even when developed within equally different traditions (Raphael 1977, Melges and DeMaso 1980). However divergent tactics may still appear, strategic thinking is on a convergent course.

~~Bowlby, J. (1988). A Secure Base~~

~~LECTURE 7~~

~~The role of attachment in personality development~~

~~Evidence regarding the role of attachment in personality development has been accumulating apace during the nineteen-eighties. Earlier findings have been replicated on samples of diverse origin; methods of observation have been refined and new methods introduced; and the role of easy two-way communication between parent and child in making for healthy emotional development has been emphasized. Since I believe this new work to have far-reaching clinical implications, my aim in this lecture has been to present a review of these findings in a form suited to those working as psychotherapists in the mental health field.~~

~~For the convenience of the reader I begin by restating in summary form some of the features most distinctive of attachment theory.~~

~~Some distinctive features of attachment theory~~

~~It will be remembered that attachment theory was formulated to explain certain patterns of behaviour, characteristic not only of infants and young children but also adolescents and adults, that were formerly conceptualized in terms of dependency and over-dependency. In its original formulation observations of how young children respond when placed in a strange place with strange people, and the effects such experiences have on a child's subsequent relations with his parents, were especially influential. In all subsequent work theory has continued to be~~