Empathy and its development

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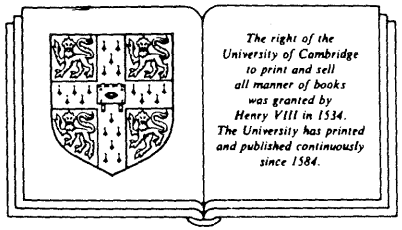

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14 Motor mimicry as primitive empathy

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History of the topic

The "most primitive form" of sympathy

In 1759, Adam Smith described a familiar phenomenon:

> When we see a stroke aimed, and just ready to fall upon the leg or arm of another person, we naturally shrink and draw back on our leg or our own arm. (1759/1966, p. 4)

This is elementary motor mimicry, overt action by an observer that is appropriate to or mimetic of the situation of the other person, rather than one's own. The observer acts as if in the other's place to the point of wincing at his pain, smiling at her delight, or (as Smith described) trying to avoid that person's danger.

In his review of sympathy and imitation, Allport (1968, pp. 24–32) documented the long – and yet humble – history of motor mimicry. From Smith on, many social theorists described it as a form of "sympathy," but always as the most primitive form. Smith felt it was "almost a reflex." Spencer (1870) called it "presentative" sympathy because it is immediate and apparently reflexive, in contrast to "representative" sympathy, which is conscious and reflective, and to the even higher (i.e., more intellectualized) "re-representative" sympathy. Ribot (1897) also proposed three kinds of sympathy. The first included, for example, "imitating the movements of a rope-walker while watching him" (1897, p. 232) and was described by Ribot as "its primitive form . . . reflex, automatic, or very slightly conscious" (p. 231). Scheler (1912/1970) reached the limit of subtle distinctions by identifying eight forms of sympathy, three of which were

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seen as "low grade, really pseudosympathy" (Allport, 1968, p. 27). Elementary motor mimicry (*Einfühlung*) was at the bottom of the hierarchy.

> *Einfühlung* [as treated by Scheler] is the primitive, reflex process mentioned by Smith, Spencer, Ribot, and others. The term "empathy" is a fair translation, provided it is understood to mean only elementary motor mimicry and is not employed in the broad sense of "an ability to understand people," as is sometimes the case today. (Allport, 1968, p. 27)

Indeed, it was from *Einfühlung* that the word *empathy* entered our language in 1912 (see *Shorter Oxford English Dictionary*).

Notice that in early usage, the standard general term was *sympathy,* and *empathy* was specific to motor mimicry. In the latter half of the twentieth century, *empathy* has come to be used as the general term, replacing old-fashioned *sympathy*. Recent usage has also turned away from fine distinctions (cf. Allport, 1961; Strunk, 1957), so that *empathy* has become a global term encompassing vicarious emotion, role taking, and the ability to understand others (and/or to project this nonverbally). Allport had a strong, even harsh, opinion of this:

> It is regrettable that with passing years the original meaning of empathy as "objective motor mimicry" became hopelessly confused and lost to view. . . . The theoretical coin has depreciated, probably beyond redemption (Allport, 1961, pp. 536–537)

In point of fact, this potential confusion has been present from the start. Both Allport (1961, pp. 533–534) and Strunk (1957, p. 47) credit the German psychologist Lipps with introducing the concept of *Einfühlung* in 1907, and both make clear that he was referring to motor mimicry, although the term itself means "feeling oneself into." Lipps assumed that the overt act led to projective understanding, not only of works of art but also of other people. In our view, the terminological problem of empathy arises from this failure to distinguish between an overt behavior and a psychological process that is inferred from it. We do not require, as Allport seemed to, a historical purity in which empathy continues to mean only motor mimicry. However, we do agree with Smith, Spencer, Ribot, and Scheler in their distinctions among various *kinds* of empathy. More is to be gained by identifying clearly what is an observed behavior (motor mimicry) and what is a hypothesized process or construct inferred from that behavior (e.g., projective understanding or vicarious feeling) than by prematurely equating the behavior with these inferences. Our hypothesis is that "primitive empathy" (that is, motor mimicry) functions independently of other empathic processes, that it is instead part of a parallel, communicative process.

Early theory and research

Allport (1968) described early theorists as both attracted to and baffled by motor mimicry. For example, Baldwin (1895, 1897) seemed to rely on "the little understood tendency to elementary motor mimicry" as an explanation of "nondeliberate imitation," noting that

> the child tends to assume the movements, strains, and attitudes of the model. He is "a veritable copying machine" and cannot help doing so. (Allport, 1968, p. 29)

Blanton and Blanton (1927) also emphasized the importance of the infant's assuming the postural tensions of the mother. McDougall (1908) had postulated "primitive passive sympathy," as well as a "nonspecific innate tendency to imitate"; but these could not explain precise overt mimesis, and Allport proposed that McDougall

> was much troubled by the process of precision which enables a child (or a parrot) to [imitate], as well as by the manifest tendency of spectators to assume the postural strains of the dancers or athletes they are watching. (p. 30)

Allport himself felt that motor mimicry "would seem to be genetically and conceptually basic to social learning and to lie at the heart of any theory of imitation" (p. 30). Nonetheless, he did not agree with those who thought that it could be explained as conditioning. He concluded that "this process of *empathy* remains a riddle in social psychology" (p. 30).

We can add other observers to those Allport reviewed. Darwin (1872/1965) described several instances of the nonverbal expression of "sympathy," especially tears for the grief or joy of another (pp. 215–217). He also noticed that his own 4-month-old son would match his (Darwin's) smile and that, by 6 months, the infant "instantly assumed a melancholy expression" when his nurse pretended to cry (p. 358). Indeed, he anticipated our view of the communicative function and social importance of such nonverbal expressions (see the section "Motor mimicry as solely communicative"):

> We readily perceive sympathy in others by their expression; our sufferings are thus mitigated and our pleasures increased; and mutual good feeling is thus strengthened. (p. 364)

Anthropologists have reported ritual "couvade" in which, classically, the father appears to undergo labor pains along with the mother (e.g., Kupferer, 1965). Margaret Mead (1968) described "empathy or imitation" in Manus culture:

> For example, a number of people are standing on opposite sides of a house, supporting themselves by holding onto rafters above their heads; as those on one side initially raise their hands to the rafters, the group facing them will also shift and grasp the rafters – empathetically – and if someone shifts from right hand to left hand, this act will be mirrored by the group on the opposite side. (p. 56)

Relatively early in this century, there were two developments that forecast the possibility of modern experimental work. Köhler (1927) and Allport (1937, 1961)

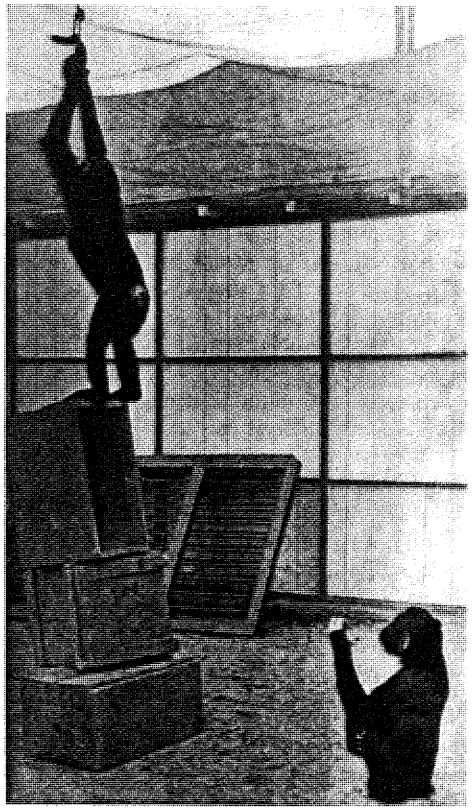

Figure 14.1. Köhler's (1927, Plate IV) photograph of Sultan watching Grande reach for bananas. Köhler added, parenthetically, "Note Sultan's sympathetic left hand."

were able to go beyond anecdotes and offer photographs of the phenomenon (see Figures 14.1–14.3). It was Clark Hull (1933, pp. 41–44) who brought motor mimicry into the experimental laboratory by arranging for an incident to occur and be recorded. He noted, "Every one has at one time or another caught himself unintentionally performing the actions which he is observing in some other person." Hull, "wishing to secure a graphic record of this fairly well known but little studied tendency," created the first laboratory demonstration. He arranged for an observer to see another person straining and reaching. By surreptitiously pinning a string to the observer's clothing and attaching this string to a rotary event recorder, Hull obtained a trace of the mimetic movements.

O'Toole and Dubin (1968) went on to conduct two full-scale investigations, one based on Hull's, of observers swaying forward while an actor strained to reach forward, and a second one of mothers opening their own mouths while

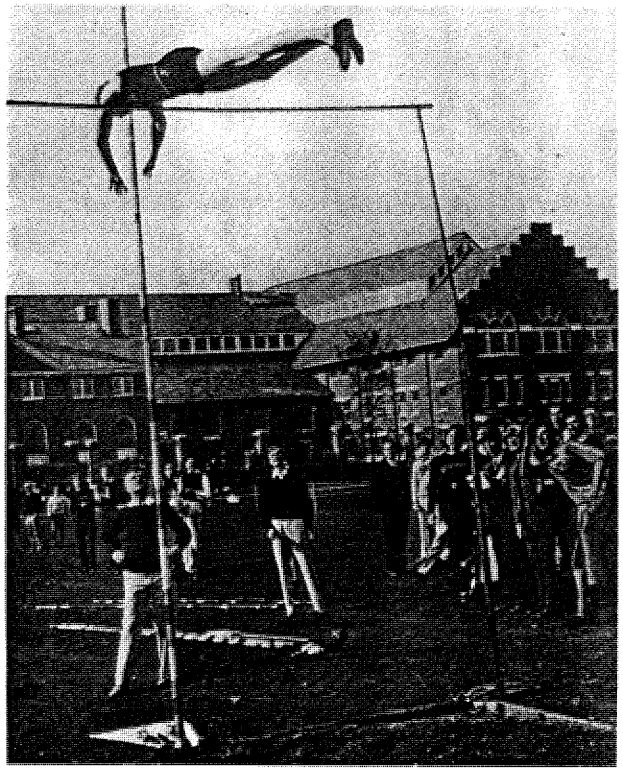

Figure 14.2. Allport's (1937, p. 531) illustration of "empathy."

spoon-feeding their infants. They saw these as instances as George Herbert Mead's (1934) "taking the role of the other." Both their empirical expression of Mead's theory and the logic of their measurements were major advances. In the first study, O'Toole and Dubin looked for and found evidence that the mother most often opened her own mouth *after* her baby had; hence she was truly mimicking and not merely trying to induce the infant to imitate. In the second study, they had an actor reach forward, with effort, from several different positions relative to the observing subject. The observer consistently swayed forward as well (more than in other directions), thus mimicking the actor's effort.

However, there are some problems with O'Toole and Dubin's data. In their body/sway study, they did not show that they had eliminated the alternative explanation of static ataxia (Edwards, 1942, 1943), which will produce forward movement (more than in other directions) even when the individual is trying to stand still. Another problem, which applies to both studies, is that these researchers were greatly handicapped by not being able to film their subjects; their live

Figure 14.3. Allport's (1961, p. 535) illustration of "empathy."

observations without reported interobserver reliabilities must be treated with some caution. Even though there is a question whether these findings meet today's standards for the study of nonverbal behavior, O'Toole and Dubin's data stand until empirically rebutted. They brought motor mimicry into the beginning of an experimental era and reestablished it as a contemporary topic.

Finally, MacInnis (1979) introduced standard, videotaped stimuli; his observers viewed up to five different incidents evocative of motor mimicry. Even under poor observational conditions, he found that an average of 40% of the subjects displayed mimetic reactions. He also obtained interjudge reliability for the observers' self-reported feelings of empathy ("as if it were happening to me") in his main study and for overt mimetic reactions to pain in a small, live pilot study. He found (as we have in all subsequent studies) that there was a strong effect of stimulus, no evidence for individual differences in the tendency to react, and no relation between the overt facial reaction and self-reported feelings of empathy.

As the above review suggests, motor mimicry is something of a persistent historical puzzle: It has been recorded as a social phenomenon for at least two centuries. Over that period, it has also been observed repeatedly, although, naturally, these observations must be judged by the standards of their time (from anecdotes to photographs to demonstrations to early experiments). It has been explained as reflex, imitation, conditioning, and taking the role of the other; it has been viewed as an indicator of sympathy or, more recently, as an indicator of empathy in the broad sense of this term. Throughout this history, it has been minimized and dismissed, labeled as "primitive," and always considered too

simple to be meaningful in itself. But it has also eluded all of our theories, and it does not go away.

Current research on motor mimicry

Motor mimicry intrigued our research group both because of this history and because these simple, natural, and often fleeting acts are, on further reflection, quite subtle. The observer after all is *not* being injured, nor eating baby food, nor straining to reach something. It is, in a sense, inappropriate to "do" the other person's behavior. Such acts give – even advertise – a false and inappropriate impression, namely, that the observer is momentarily the other person in that person's situation rather than his or her own. Why should people do this? Indeed, do they really do it?

Methods for studying motor mimicry

The prerequisite for answering these questions was to improve the methodological and technical state of research on the topic. In order to understand motor mimicry, we first had to capture it for analysis and measure it objectively. Moreover, it was highly desirable to seek a wide variety of instances, in order to show that motor mimicry is a class of behaviors rather than just a few isolated cases. The details of the methods developed are described in Bavelas, Black, Lemery, MacInnis, and Mullett (1986).

Because of the importance of having a permanent record, both for reliability and for frame-by-frame analysis, all experiments are videotaped. Typically, the observer is presented with an incident likely to evoke motor mimicry while being videotaped in split-screen so that both the stimulus and the response are on the final tape.

The stimuli have been presented "live," on videotape, or in narrative. That is, we have enacted incidents that were real, or apparently real, in front of the observer; we have used videotaped excerpts from documentary films or from television and have also produced our own incidents on videotape; and we have simply described incidents or told stories. The typical episode is quite short. Indeed, as it has become clear how precise and synchronous the responses are, we have shortened our stimuli from a minute or so to only a few seconds long.

A broad class of incidents has been found to evoke motor mimicry. These include pain (caused in different episodes by an apparent cut, burn, shock, hammer blow, or crushed finger), laughter, smiling, affection, embarrassment, discomfort, disgust, facing a thrown projectile, ducking away from being hit, stuttering, word-finding, reaching with effort, and succeeding and failing at a timed task.

Having evoked a mimetic reaction and captured it on videotape, the final prerequisite is to score it. In our working definition, motor mimicry is identified as a reaction by the observer that is

1. similar to one made by the other person (e.g., leaning or smiling when the other does); or
2. one that the other person might make in his or her situation (e.g., Adam Smith's description of shrinking from a blow to another – whether or not the other does); but
3. not what the observer would do as observer (e.g., verbal expressions of concern); and
4. not irrelevant or involuntary behaviors (e.g., startle or ataxia).

These are the principles by which motor mimicry can be distinguished from other behaviors in any given situation. The behaviors thus identified have been reliably scored simply for presence or absence and also for clarity, pattern, quantitative parameters, and microanalysis of synchrony (see Bavelas, Black, Lemery, MacInnis, & Mullett, 1986; Bavelas, Black, Lemery, & Mullett, 1986).

The microsynchrony of the reaction is worth emphasizing here. Motor mimicry is by no means a single diffuse or global reaction to the evoking incident. When an observer is filmed in split-screen with a sequential stimulus, it becomes obvious that he or she makes several different responses, which are minutely synchronized to the stimulus as it unfolds. For example, in one study (Bavelas, Black, Chant, Lemery, & Mullett, 1987a), we found that virtually all reactions to a 2-minute video clip showing a series of medical procedures were closely related to the immediate stimulus. When *all* voluntary behaviors were counted in 5-second segments, they were shown to be nonrandomly distributed over time and significantly related to the degree of intensity of the stimulus at that particular moment in the stimulus.

A communicative theory

The usual way of approaching motor mimicry has been as a manifestation of an intrapersonal state. For Smith, Spencer, Ribot, Scheler, and Darwin, motor mimicry was hardly separate from primitive feelings of sympathy, for they saw it as an expression of such feelings. Lipps associated motor mimicry with projective understanding. O'Toole and Dubin (following G. H. Mead) interpreted it as a manifestation of the cognitive process of taking the role of the other. In all of these theories, the overt behavior itself is seen as a kind of overflow from the primary event, which is an intrapersonal one.

Contemporary psychological approaches to nonverbal behavior would see motor mimicry as an expression of vicarious emotion or empathic feelings. So, although the earlier theories (with the exception of Mead's) probably appear very old-fashioned to modern readers, in fact the paradigm is the same. This traditional psychological model of expressive behavior proposes that the stimulus initiates an intrapersonal process (whether it be called sympathy or vicarious emotion) and that this process leads to nonverbal behaviors that indicate or express the internal state.

In contrast, we propose that motor mimicry is not necessarily expressive *of* any internal state; however, it is expressive *to* the other person in the situation. Our theoretical framework (e.g., Watzlawick, Beavin, & Jackson, 1967) views any behavior that occurs in a social context as potentially communicative. So we would point out that there is always an *other person* in the situation when motor mimicry occurs. Therefore, the focus of study should be expanded to include this other person as well as the potential effect of the behavior on him or her.

Watzlawick et al. (1967) went on to propose (pp. 62–67) that nonverbal behaviors in particular convey analogic information to others about our relationships to them. Applying this principle to motor mimicry, we can see that the observer momentarily portrays him/herself as feeling like the other by leaning, wincing, or smiling as if in the other's situation. Rather than simply saying, "I know how you feel," the observer actually *shows* how you feel, in the analogically coded equivalent of the verbal statement. This suggests that motor mimicry is more than a nonverbal behavior; it is a nonverbal communication intended to convey "fellow feeling" to the other person. (At this point, there is an immediate, obvious question; namely, Why do people show motor mimicry when they are alone, as they apparently do? This issue is addressed at the end of this section.)

Thus we propose that, although the eliciting stimulus may also evoke intrapersonal reactions, it is not these that lead to motor mimicry, the visible display. Motor mimicry is a function of the interpersonal, communicative situation, not the by-product of private experience. We propose that these are parallel processes: The same stimulus may set off both internal reactions and overt display, but these function independently, just as they do for the case of verbal language. Language is not the simple product of emotion or cognition, not the involuntary consequence of any intrapersonal state; rather it has a domain of its own, in human interaction. Yet the usual model of nonverbal behavior is that, unlike language, it is merely a behavioral "indicator" that reveals, often inadvertently, the individual's internal experience. We sought data that would test this model against a communicative one.

Experimental evidence

There is a fairly direct experimental test of our theory, based on a straightforward deduction: If motor mimicry is a communicative act, then it should

be affected by communicative variables in the interpersonal situation in which it is evoked. If, on the other hand, it is solely the manifestation of an intrapersonal process, then such variables should have no effect.

Therefore we (Bavelas, Black, Lemery, & Mullett, 1986) enacted the same painful injury, in which a male experimenter dropped a heavy TV monitor on an apparently already injured finger, in two different versions. In one condition, because of his initial orientation, eye contact with the victim appeared probable and did indeed occur shortly after the injury. In the other condition, eye contact appeared unlikely at the time of the injury and did not occur. If motor mimicry (in this case, any expression of pain such as wincing) expresses the observer's own or vicarious emotional reaction to the injury, then only the constant injury should matter; hence there should be no difference between experimental conditions. If instead motor mimicry is meant to be seen, then the availability of the victim as a receiver should affect its display.

The experiment, which is described in detail in Bavelas et al. (1986), proceeded as follows: Forty-two female undergraduate volunteers were instructed simply to act as observers. Because the injury itself would take only a few seconds and was to appear as an accident, the experiment began with another, irrelevant task. After that, the main experimenter (*E*1) and a helper (*E*2) began setting up equipment so that the observer (*O*) could watch TV. While they were carrying in the TV monitor together, *E*1 (who had a conspicuous splint on his left middle finger) slowed down at a point about 4 feet in front of *O* and suggested to *E*2 that they set the TV down on the table there. As they tried to do so, the end of the monitor that was closest to *O* landed directly on *E*1's splinted finger. There were two versions of what followed, both carefully rehearsed for precise enactment:

Eye Contact

Injury and sharp intake of breath; *E*1's face begins to show pain.
*E*1 brings head up and glances at *O* (with defocused eyes) as head rolls back.
Two seconds after start of injury, *E*2 lifts TV off *E*1's hand.
*E*1 pivots fully toward *O*, in semicrouch, holding his hand. Looks at hand, then directly at *O* for 1 second, with "blank" face.

No Eye Contact

Injury and sharp intake of breath; *E*1's face begins to show pain.
*E*1 hunches down over TV, with face (still showing pain) visible to *O* in profile.
Two seconds after start of injury, *E*2 lifts TV off *E*1's hand.
*E*1 pivots fully toward *E*2, in semicrouch, holding his hand. Looks at hand, then directly at *E*2 for 1 second, with back to *O*.

Four seconds after the start of the injury in both conditions, *E*2 asked, "Are you okay?" *E*1 looked at *E*2, then said, "Yeah, I think so," examined his hand again, and concluded, "It just hurt for a minute." (They went on to hook up the equipment without looking at *O*; then *E*1 told *O* about the video episodes she would be watching. After watching these, *O* was interviewed and asked to describe everything she saw during the experiment.)

Because of our previous data on the microsynchrony of an observer's mimetic behavior to a stimulus, it was vital that the injury sequence, which was only 4 seconds long, be precisely planned, rehearsed, and executed. Manipulation checks showed that this was in fact done. Although data from five observers could not be used because they interrupted the sequence and threw it off, and there were two videotaping problems, in only three cases did the experimenters themselves fail to execute the sequence exactly. For the 32 usable cases (15 Eye Contact and 17 No Eye Contact), all common points of the two scripts were enacted identically to within tenths of seconds; there were no significant differences in timing between the Eye Contact and No Eye Contact conditions.

As predicted, there were significant variations in the pattern and display of motor mimicry as a function of the probability of eye contact (see Bavelas, Black, Lemery, & Mullett, 1986, for full details). When this probability increased, the observer's mimetic expression typically occurred quickly and either continued or actually increased in intensity. When, in the other condition, the probability of eye contact decreased, motor mimicry usually either began but then faded or did not occur at all. Direct evidence for the "delivery" of motor mimicry can be found in the expressions at the precise point of eye contact, where 10 of 15 observers were displaying clear motor mimicry.

A plausible alternative explanation would be that, because of fuller facial visibility, the injury seemed more painful in the Eye Contact than the No Eye Contact condition. For this reason, a great deal of planning and pilot work had gone into making the latter injury appear just as painful. There is also the evidence of the observers' other behaviors: Observers in the Eye Contact condition *smiled* (usually in addition to wincing) significantly more often than did their counterparts – an unlikely response if the injury indeed appeared more painful. (We interpret these smiles not as "sadism" or amusement, which would presumably have been more likely to be displayed when not seen, but rather as "sympathetic smiles," which were reassuring or face-saving, that is, as communicative acts as well.)

It is possible that a modification of the intrapersonal model could incorporate these effects of visual availability as follows: In the minimally communicative condition, the injury itself led to the hypothesized internal process (e.g., taking the role of the other or vicarious emotion), which led to some motor mimicry. The amount occurring here is thus seen as a "base rate" of the primary reaction. When the other person was more visually available, a secondary social process enhanced the reaction, thereby increasing the probability of its being manifested.

This model is consistent with the usual view in which intrapersonal processes are "primary" and social behavior is "secondary." A simple derivation from this model leads to an empirical test: The hypothesized secondary, social process would take some time, however short – time that would be added onto the primary, internal reaction that must occur before it. Therefore, the reactions produced in this condition would have to occur somewhat later. However, there was no significant difference in the time at which the first mimetic expression appeared. On the contrary, the reactions in the Eye Contact condition were, on average, *faster* than those in the No Eye Contact condition (1.04 vs. 1.32 seconds). These data cannot support a sequential, two-stage model.

In the second part of this experiment, we went on to test a corollary deduction, that if motor mimicry is a nonverbal message sent to the other, then it should be systematically decoded by receivers. A second set of 10 subjects rated the videotapes of the 32 observers' faces for their meaning. These "naive decoders" were first told about the injury the observers were witnessing, although of course not about the two experimental conditions. They were then asked to rate the extent to which the nonverbal behavior of each observer indicated that she *knew* how the victim felt, *cared* about what had happened to the victim, and had reacted *appropriately* to what happened.

There was a good consensus on the meaning of the expressions (intraclass r's = .87 to .89), and the averages for the "knows" and "cares" scales differed significantly, as predicted, for the two experimental conditions. The behaviors of observers in the Eye Contact condition were rated as significantly more knowing and caring than were those of observers in the No Eye Contact condition. The "message" the former sent was apparently understood; the latter group, on the other hand, were sending no message or one that faded quickly.

In our most recent study (Bavelas, Black, Chovil, Lemery, & Mullett, 1987b), we examined the *form* of mimetic reactions in order to establish their communicative function. By a somewhat more complicated process of deduction than described above, it is possible in some instances to distinguish between communicative and intrapersonal causes of the behavior. Most intrapersonal theories propose that motor mimicry occurs because the observer psychologically supplants the other. The most explicit example is Mead's (1934) "taking the role of the other" from the standpoint of the other, as applied by O'Toole and Dubin (1968) to motor mimicry. These authors proposed that the individual momentarily puts him/herself into the place of the other person, seeing the situation from that point of view and even acting, on that basis, like the other. Similarly, most theorists who cast empathy as projection, identification, or vicarious emotion implicitly make the assumption that the empathizer has "put himself in the place of the other" and is having the other's reaction.

The difference between this family of theories and ours is a subtle one. They

propose that the observer takes the other's place momentarily, feels the other's feelings, and *has* the other's reaction. (Indeed, these elements are usually seen as the criteria of true empathy.) We propose that the observer is not having the other's reaction but is portraying it. He or she is sending the message, "It is *as if* I feel as you do." In other words, the motor mimicry is an encoded representation quite different from, say, actual pain. It is, in Ekman and Friesen's (1969) terms, a nonverbal illustrator or, in McNeill's (1985), a referential gesture, functioning like verbal language but (in our view) with a certain advantage of eloquence owing to its analogic coding. In most instances, motor mimicry would look the same regardless of which process lies behind it. For example, if the observer took the role of another person who was in pain, he or she would wince in much the same way as if representing that person's pain. This is an inherent characteristic of analogic coding – it is highly similar to the reaction it represents.

However, there is one instance in which reactions governed by the two processes would differ, and that is left–right leaning. Imagine that the observer and the other are facing each other. Suppose the other ducks to her right to avoid something; the observer might also lean quickly, in motor mimicry. Freeze this scene for a moment and consider the two different possibilities, based on the observer's possible psychological processes: If the observer has taken the role of the other, he will have (psychologically) rotated into her position and will therefore also duck to his right. This would mean moving in the *opposite* direction from the other's movement (i.e., to her left). Other intrapersonal theories might dispute that such an elaborate cognitive process could be happening so quickly and accurately. Such theories would have to predict no differences – left and right leaning should be equally probable.

Yet, for some reason, any movement in the opposite direction strikes us as looking odd. We propose that it looks odd because it breaks the principle of analogic coding. If, as in our theory, the observer is sending a message by leaning, specifically, conveying that he feels *like* the other – then he would move *like* her, in a way that is clear to her. He would therefore move in the same direction she did, to her right with her, which is to his left. Note that, in this case, the observer remains (psychologically) in his place and *in relation to the other,* rather than supplanting her in any way. (The term *mirroring* has been used in the nonverbal synchrony literature for such movement in the same direction, but there is no consistent term for the opposite movement. We prefer the topological terms, *reflection symmetry* and *rotation symmetry,* respectively.)

Thus, there is one instance in which form may reveal function, where the topography of the mimetic response would be different depending on the causal process behind it. If a communicative process is determining the behavior, then mimetic reactions should take the reflected form. If instead the process is one of

taking the role of the other, then motor mimicry in this situation should follow rotation symmetry. If some other, less cognitive vicarious process is involved, then the direction would not matter, so both forms should occur, with equal probability.

The experiment was, therefore, a simple one. A female experimenter told 23 male or female volunteer subjects two stories about "near misses." After the first, warm-up story she told one about nearly being hit (accidentally) by the wild arm-swings of a much taller person at a party. There were two points at which she enacted a sharp duck to her right. The videotapes were analyzed for left–right movements occurring within 1 second after each of these two incidents. Twelve of 23 observers leaned at least once. Eleven of these leaned left, reflecting the experimenter; one leaned right.

In this experiment, the form that motor mimicry took was the one predicted by a communicative theory. Role-taking and equiprobable responding are obviously eliminated by these data. In a series of subsequent decoding studies, subjects were asked which form conveyed "involvement" or "being together." Reflection symmetry was consistently chosen over rotation symmetry. An unexpected finding was that the eye contact variable reappeared in these decoding studies: Even in photographs shown to third parties, there was an effect of whether or not there was eye contact between the two people in the photo; where there was no eye contact, the choices were random.

We do not believe that any intrapersonal theory can find in its particulars any way to predict the bias toward reflection symmetry. Such mirroring makes sense only when the other person is in the picture as well. Thus, these results cannot support the theory that intrapersonal processes lead to motor mimicry, which then has a secondary or incidental social function. The form of the behavior suggests that communication is its primary or original function.

Motor mimicry as solely communicative

In summary, we have data indicating that

1. motor mimicry is differentially affected by the visual availability of a receiver;
2. its display is synchronized to this visual availability;
3. decoders agree on its meaning;
4. it occurs very rapidly, with a reaction time that seems to rule out prior internal processes; and
5. its form (reflection symmetry) is consistent with analogic coding rather than role taking or vicarious experiencing.

These data make sense if we go back to historical distinctions among various forms of sympathy (or empathy) rather than grouping them so that a single global process must include all instances. Motor mimicry is no more and no less than the overt behavior visible to others. We propose that this behavior is parallel to, and independent of, any intrapersonal reaction that the same stimulus may elicit. Incidents such as the experimenter's injury or the "near miss" story may well evoke some of the intrapersonal processes proposed by such theories. But these processes neither lead to nor shape the form of motor mimicry, which occurs for a different reason.

It is important not to confuse our theory with a "behaviorism" that denies the existence of processes that cannot be observed. We simply propose that the overt reaction occurs in parallel to any intrapersonal reaction rather than serially, which is the usual model. Motor mimicry itself is best (and, in our opinion, only) accounted for by its interpersonal function, which operates separately and by its own process, a communicative one.

There are two interesting speculations that could be put to our theory. First, if motor mimicry is a purely communicative act, why would it ever occur when the individual is alone? Second, if it is indeed independent of internal feelings, what would be the function of such a behavior?

The first question can be rephrased more formally: We have shown that *some* motor mimicry is communicative; is it the case that *all* motor mimicry is communicative, that is, that there are no noncommunicative instances? This possibility would seem to be eliminated by the occurrence of motor mimicry in nonsocial settings, for example, when one is watching TV or a movie. We have three alternative, communicative explanations for such displays. First, in our experiments using video stimuli (Bavelas, Block, Lemery, MacInnis, & Mullett, 1986), the observers were still in the presence of an experimenter and a camera, both of which are potential receivers. Similarly, as is well known to those who cry in movies, one can be seen by others even in a darkened theater. Second, when this is not the case (e.g., when the individual is home alone watching TV), the personification on the screen may well become, momentarily, a person real enough to be a receiver. Consider that we easily accept the notion that the *plot* can become psychologically real and thereby cause considerable emotion. It is no more far-fetched to propose that motor mimicry can be caused by a fictitious receiver than to propose that emotions can be caused by fictitious plots. Or, third, the "totally alone" case can be explained by analogy with language. When alone, we often think in words, and these words are sometimes mouthed or actually said (e.g., "Oh NO!" when a big mistake is made). Similarly, we represent some reactions nonverbally, and these too may be expressed even when alone.

If a plausible case can be made for motor mimicry's being solely communica-

tive, then why would this occur? Why should people display to others something that may or may not reflect their current internal state? Even more, why should this display be so rapid and so precisely tuned to the receiver's availability and decoding? We propose that this happens because motor mimicry conveys a message that is of vital importance to our relationships with others: I can feel as you do; I am like you.

Humphrey (1983) has reasoned that human consciousness evolved principally to anticipate other humans' reactions and, in aid of this, to empathize with their experiences. Yet if this had not led to behavior, it would have had no selective advantage. Empathy has been of interest to social theorists because of its importance for society (e.g., Clark, 1980). Yet empathy that is merely felt and never acted on has no social implications. Agony or joy for another is a private experience unless it appears as words or actions. Conversely, appropriately expressed words or actions can have their salutary effect whether or not accompanied by the private experience of empathy.

In our view, the search for the elusive link between empathic experience and overt behavior has overlooked the humble instance of motor mimicry, which gets on with the job of expressing empathy to the other. Recall Darwin: "We readily perceive sympathy in others by their expression; our sufferings are thus mitigated" (1872/1965, p. 364). It is in this sense that motor mimicry can still be called primitive empathy; it may be the prototype rather than a trivial instance. Motor mimicry does not wait for full comprehension of the situation of the other. Nor does it require that the observer first experience the other person's feelings him/herself. The first priority is to display similarity to the other, and this it does rapidly and precisely. We propose that humans are "primed" for such primitive empathy. That is, they are acutely tuned to the situations of their fellows; they process this information quickly and then immediately register, nonverbally, that they have done so. They may go on to understand or feel the other's situation in a more deliberative sense, and this may well lead to words or further action. But the social priority is so high that immediate communication comes first.

Mimetic synchrony as a class of nonverbal behaviors

Motor mimicry is similar in many respects to certain other nonverbal behaviors such as posture sharing and movement mirroring, which are usually found in the quite separate literature on nonverbal synchrony. We propose that part of this literature is in fact a separate class of its own, which we will call *mimetic synchrony*, of which motor mimicry is a special case.

Nonverbal synchrony was "discovered" by the microanalyses of Scheflen (1963) and Condon (1963), both of whom noticed the striking synchronicity of nonverbal behaviors in the flow of interaction. A substantial and diverse literature has ensued (e.g., Davis, 1982). It is our interpretation of this literature that two different kinds of synchrony, rhythmic and mimetic, have been found. By far the dominant interest has been in rhythm. For example, Condon and Ogston (1966) identified two kinds of rhythmic synchrony: self-synchrony, which is the timing of the speaker's nonverbal behaviors to his or her own speech, and interactional synchrony, the timing of the listener's nonverbal behaviors to the speaker's speech. Interaction rhythms seem to function to achieve and maintain the coordinated flow that characterizes, and makes possible, spontaneous dialogue. A remarkable variety of behaviors and channels may be interwoven in such synchronies, but the focus of interest is the entrainment or coinciding of these words and actions. Investigators of this kind of synchrony usually find it by extremely fine microanalysis, because their "events" are the onsets and offsets of behavior; these changes of state are the essence of rhythm.

A second class of behaviors, although similar in many respects, is nevertheless distinguished by *the simultaneous display of similar behaviors*. These mimetic synchronies – for example, similar postures or mirrored movements – are not cross-modal, and they are observable in real time. We found that most of the researchers who have included this kind of synchrony have also implied that it reveals or is caused by the relationship between the interactants (rather than serving to coordinate the interaction).

Scheflen (1964) suggested that congruence of posture indicates similarity in views or roles. In 1969, Dabbs reported two experiments in which he varied whether a confederate interviewee either mimicked or took positions opposite to those of the subject; he found that this led to strong differences in the evaluation of the confederate. Kendon (1970) observed synchronous movement among interactants in a public drinking house. He noted that "movement mirroring" appeared only between speaker and addressee. Kendon speculated that this heightens the bond between these two and at the same time differentiates them from the others present.

Goodwin (1981) noted a relation between nonverbal "congruence" and topic. Congruent (similar) postures reflected mutuality of topic and interest, whereas moving out of congruent postures was associated with a change of topic. (He also noted that such fine movements as eyebrow flashes were mimicked by the other person within less than 0.1 second.) Matching behaviors and their relation to speech content and rapport have also been studied in therapeutic interactions by Scheflen (1963), Charney (1966), Trout and Rosenfeld (1980), and Daubenmire and Searles (1982)

La France (e.g., 1982) explicitly connected posture mirroring with motor mimicry and with the relationship between the interactants. Elaborating on Scheflen's (1964) hypotheses, she proposed that postural coordination could lead to a feeling of rapport and reflect a common definition of the situation or a common

orientation; lack of such mirroring could signal discord or even cause it. Two correlational studies (La France, 1979; La France & Broadbent, 1976) showed that rapport in seminar classes correlated significantly with posture sharing. An experiment (La France, 1985) confirmed that arm mirroring varied as a function of cooperative versus competitive orientation in pairs of dyads listening to a tape.

Davies (1984) independently found the same effect in our laboratory. He asked four strangers to have a debate, one pair against the other. Individuals were randomly assigned to these two "teams," and the initial level of movement synchrony was a significant function of this pairing (higher for cooperating pairs than for competing pairs). Moreover, as the teams were reassigned by the experimenter in all possible combinations, the synchrony tracked the relationship – the new cooperating pairs synchronized with each other more than with their previous partners.

Finally, mimetic synchrony has been observed in infants. Lieberman (1967) studied mimetic changes in intonation and found that the child tracked the adult frequencies. That is, the fundamental frequencies that measure pitch were highest when playing by himself, lower with his mother, and lowest with his father. Rosenthal (1982) showed that mothers and their 3-day-old infants co-vocalized significantly above chance; that is, when one vocalized, the other "chimed in." Meltzoff and Moore (1977) have reported facial mimesis in very young infants, although this finding is a disputed one (Koepke, Hamm, Legerstee, & Russell, 1983).

In brief, there seems to be a sizable and widespread group of mimetic synchronies, in which *A*'s behavior is followed closely by a matching behavior by *B*. These bear an interesting similarity to motor mimicry; both involve the virtually simultaneous display of similar behaviors, and both seem to convey, analogically, the relationship between the interactants ("I am like you"). Indeed, some of the classic motor mimicries such as leaning and body sway appear indistinguishable from the larger set.

In most cases, however, motor mimicry forms a special subset having three identifying features: Motor mimicry has a unilateral pattern; that is, the observer mimicks the other but not the reverse, whereas other mimetic synchronies are reciprocal actions that either person may "lead," or that may be shared. Second, motor mimicry is typically fleeting rather than slow-moving or even static (as, for example, sitting in the same posture). Finally, most mimetic synchrony remains in the background; indeed, the interactants are often self-conscious if they become aware of it. In contrast, motor mimicry (especially a facial expression such as a wince in our experiment) is often the "figure" for that moment in the interaction. Thus the broader class contains nonverbal signals that may be "left on" for minutes at a time, so that the relationship message is being quietly broadcast almost constantly, while the verbal content changes more rapidly. Motor mimicries, on the other hand, follow this shorter-term flow of the interaction, often acting in conjunction with verbal phrases (e.g., a wince followed by "Are you okay?").

A communicative view of nonverbal behavior

As Trevarthen (1977) has implied, movement itself has been treated as "mere movement," almost as trivial, principally because its precision cannot be seen in real time. Our work with motor mimicry has led us to respect the "merely motoric" and to see nonverbal behavior in general in a new light. In our reading of the literature, nonverbal behavior is usually treated as the weak servant of the mind. For example, nonverbal behavior has often been of interest because it is thought to be under less control than verbal language, so that it will "leak" the truth despite the individual's control of what he or she says verbally. Even when nonverbal behavior is seen as expressing attitudes or feelings directly, it is considered to be imprecise and ineloquent. The information to be gathered from nonverbal behavior is seen as global and diffuse (e.g., simply a positive/negative attitude or a dominant/submissive orientation), with none of the subtlety of verbal language. Even terms like *nonverbal communication* or *body language* are usually misnomers, because nonverbal behavior is not treated as true language or communication. In the rare instances where nonverbal behavior qualifies to be called nonverbal communication, it still seems to be cast as the redundant inferior to true language.

Furthermore, human nonverbal behavior is rarely treated as interactional. Kraut and Johnston (1979) have made this point particularly well by comparing the approach of most psychologists to that of ethologists. The former tradition sees nonverbal behavior almost exclusively as emotional expression:

> As a result, it has often embedded the study of nonverbal behavior in individualistic psychology by treating individuals as socially encapsulated. (p. 1552)

Ethologists, on the other hand, have not been concerned with any emotions behind the nonverbal behavior of the animals they study. Rather, they have

> stayed concerned with the functions of nonverbal displays and their social consequences. (Kraut & Johnston, 1979, p. 1552)

Indeed, the ethological term *display* emphasizes this interactional focus.

There is an important methodological implication in this difference. Kraut and Johnston point out that Ekman, Friesen, and Ellsworth (1972) reviewed over 100 studies since Darwin on human facial expression of emotion and found *no* studies examining the effects of nonverbal expression on social interaction. Therefore, we would add, no such effects could be discovered. The study of nonverbal behavior as expressive of intrapersonal events is self-confirming in its method-

ology; if social factors are not studied, their effects will not be uncovered. As Spitz and Wolf (1946, p. 59) pointed out, this is like trying to understand the law of gravitation by studying one body.

We propose that, rather than being an extension or indicator of an emotional state, nonverbal expressions *represent* such states to other people. It is a classic error to confuse a word with what it represents. Similarly, we should not confuse an analogic or iconic behavior with what it represents. Nonverbal expressions can occur before, during, or after an emotional state; they are independent of such feeling, to the same degree words are. (And, just as words, they can express a much wider variety of ideas than only feelings.)

When the necessary methodology has been used to look at nonverbal behavior in this way, the results are encouraging. Spitz and Wolf (1946) found that infants smile at human eyes, virtually independently of emotional state. Trevarthen (1977) has proposed that the earliest mother–infant interaction is content-free; it seems solely to establish the process of communicating with each other. Kraut and Johnston (1979) showed that smiling (by adults) is a function of the availability of a receiver, not the emotional state of the sender. Our data, reported here, confirm this principle with a new set of nonverbal behaviors. McNeill (1985) has argued that many gestures should not be considered "nonverbal" but rather part of the same processing that produces verbal speech.

If we could see nonverbal behavior without preconceptions, then we would be led by parsimony to propose first that it may be communicative. Why would such a behavior appear if it were not meant to be seen? Why should it merely "spill over" from internal events? Nature is neither slipshod nor wasteful; other human behaviors are precise and functional. Therefore, if a behavior is made visible to others, it is reasonable to start with the assumption that it is communicative. There is a good deal of evidence to suggest that nonverbal behavior expresses precise information to others and that it is part of the communicative process through which we are connected to others. Rather than using it as a route into the mind, we can follow it outward, into the social interaction.

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