INTERACTIONAL SYNCHRONY: GENUINE OR SPURIOUS? A CRITIQUE OF RECENT RESEARCH

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ABSTRACT: In two recent articles, McDowall (1978a, 1978b) has challenged the micro-analytic work of W. S. Condon and Adam Kendon. Specifically, he has argued on the basis of his work that "interactional synchrony" is not a genuine phenomenon, but rather a statistically expectable "noise" in social interaction. In this paper, we demonstrate that McDowall's results are inconclusive because of confusion as to what constitutes interactional synchrony. We clarify these issues and place McDowall's experiments in their proper perspective.

Analysis of the structure and communicative significance of nonverbal behavior in relation to speech has revealed that the temporal sequencing of body motions is extraordinarily complex. Rather than a simple linear ordering of discretely organized entities, nonverbal behavior is apparently characterized by many different "units" (motions) happening simultaneously and in multiple layers of duration. The pioneering work of Bateson (1951, 1972; Bateson & Mead, 1942), Birdwhistell (1952, 1970), and Scheflen (1960, 1963, 1965), among others, attempted to construct methods for understanding what Scheflen called the "stream of behavior."

Following from the work of these authors, W. S. Condon and his associates developed a method of transcribing the "behavioral stream" at sub-second levels. Using a high-speed motion picture camera (typically run at 24 or 48 frames per second), Condon minutely examines filmed behavior for change points in the motion of various body parts. The records of his observations are in a matrix form where each row represents a given body part and each column is a single frame of the motion picture film.

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In 1966, Condon and Ogston published the results of their first studies using this methodology. They reported new phenomena which were observable as a result of their inductive methodology. They noted that normal human beings exhibit remarkable integration of speech and body motion at the sub-second time scale. This "organization of change" within a single person was labelled "self-synchrony." Such harmonious interlinkage between two interacting persons they labelled "interactional synchrony" (Condon & Ogston, 1966, p. 342).

Kendon focused on "interactional synchrony" as an important phenomenon in some of his published work (1970, 1973). Here again, the primary data consisted of high-speed films of human interactions. Kendon's view of interactional synchrony, however, is somewhat different from that of Condon. Kendon has proposed that interactional synchrony serves rather specific communicative functions, whereas Condon tends to regard it as a permeating, fundamental property of normal human interaction.

McDowall (1978a, 1978b) has recently tried to test the empirical validity of this phenomenon. He has concluded on the basis of his work that interactional synchrony is nothing but a random coincidence of body movement change points. In this view, the boundaries of nonverbal behaviors align with one another no more than would be expected by chance. It is not, therefore, a "genuine" phenomenon.

We believe McDowall's experiments are based on a misunderstanding of what Condon and Kendon mean by interactional synchrony and therefore do not speak directly to the issues raised by these two authors. We do feel, however, along with McDowall, that the phenomenon must be more carefully and completely scrutinized, particularly because of its obvious appeal and the claims which have been made for its significance.

In what follows, we first briefly review the work of Condon and his associates. We then consider the approach taken by Kendon. In light of this discussion, we critique McDowall's work.

INTERACTIONAL SYNCHRONY: CONDON'S WORK

Four works by Condon and his associates (Condon, 1970; Condon & Ogston, 1966, 1967a, 1971) explicate details of Condon's micro-analytic method, equipment used, and offer basic definitions which underlie his other work. In addition to these "fundamental" papers, Condon has explored the limits of his central ideas in several directions. In particular, he has sought to apply his work in the area of child development and language acquisition (e.g., Condon, 1975, 1977, 1979; Condon & Sander, 1974a, 1974b) and has suggested its usefulness in the study of comparative animal behavior (Condon & Ogston, 1967b, 1971) and schizophrenic behavior (Condon & Brosin, 1969; Condon & Ogston, 1966).

The initial studies had two main goals: "(1) the search for pervasive, recurrent and predictable regularities in 'normal' behavior and (2) the comparison of the observed regularities in 'normal' behavior with those of 'pathological' behaviors of various types" (Condon & Ogston, 1966, p. 342).

A basic aspect of Condon's work is his open-ended, inductive orientation to what constitutes a unit of behavior. In his first studies, he and Ogston emphasize this problem as one of their major concerns (1966, pp. 338-342; 1967a, pp. 221-225; 1967b, p. 359). Their method for transcribing behavior reflects this restraint from preconceived categories of significant behavior. They do not scan film footage for occurrences of a particular configuration of behavior and then inquire into its possible communicative function(s). Rather, they transcribe as much of the total panorama of behavior as possible and observe behavioral units as they emerge in the data.

The recording equipment segments time into 24, 36, 48, etc., frames per second (f.p.s.). Thus motion is analytically represented as change in a discrete space. The method further segments nonverbal behavior according to anatomical principles, i.e., the analyst initially considers each body part an independently moveable component. Next, movement itself (the intersection of body parts and time) is analytically distinguished into nonchanging and changing. The key points in the behavior of each body part are not simply when the part is moving, but rather when the body part changes its inertial state. An inertial change point is defined as an initiation, a termination, or a change in the direction of movement. By applying these distinctions, Condon produces his secondary data base—a transcript of the behavior recorded on film. He also locates speech sounds (Note 1) on the same graph. All of this is preliminary to the real object of study, which is the identification of units of coordinated behavior.

The lowest-order unit of coordinated behavior is termed a "process unit." A process unit is a bundle of body parts which (empirically) change and sustain inertial states with one another for a given duration.

> A "process unit" is observationally defined as the initiation and sustaining of directionality of change of body parts with each other (the specific directions being sustained by the individual body parts may differ as well as the specific body parts which are moving) through a given interval of time as contrasted with preceding and succeeding sets of similarly sustained configurations of movement. (Condon & Ogston, 1966, p. 342; see also Condon & Ogston, 1967a, p. 224)

In identifying an actual process unit, Condon acknowledges that redundancy is an important criterion in determining the boundaries. For example, if seven or ten body parts share inertial change points, this is a stronger case for demarcating a boundary of a process unit than if only two or three body parts share inertial change points (cf. Condon & Ogston, 1966, p. 341). Redundancy is left without further specification. It stands as a general guideline to be interpreted intuitively; they do not indicate that four, six, or some percentage of body parts share movement-change boundaries in order to identify the beginning or end of a process unit.

The definition of "self-synchrony," and subsequently "interactional-synchrony," is predicated upon the notion of a process unit. Process units are realized by relatively globally-synchronized changes of inertial state in body movements. One such case constitutes a process unit, but the on-going flow or emergence of process units in behavior is what is meant by "self-synchrony," that is,

> As a normal person speaks, his body "dances" in precise and ordered cadence with the speech as it is articulated. The body moves in patterns of change which are directly proportional to the articulated pattern of the speech stream. . . . There are no sharp boundary points but on-going, ordered variations of change in the body which are isomorphic with the ordered variations of speech. This has been called self-synchrony. (Condon & Ogston, 1971, p. 153)

Interactional-synchrony occurs when participants in an interaction share process unit boundaries. In other words, the participants' various bundles of inertial changes in their *speech* and *body* movements may or may not be in temporal alignment with one another. When the self-synchronies of interactants correspond, then we may speak of interactional synchrony. Condon proposes that it does occur in all interactions between "normal" people (Condon & Ogston, 1966, p. 342; 1971, p. 159). In fact, it would seem that interactional synchrony occurs in somewhat limited fashion between a "normal" human and a "normal" chimpanzee (Condon & Ogston, 1967b), but far less frequently, if at all, in "pathological" individuals.

From the first, Condon's work has focused almost exclusively on dyadic interaction and on the relationship between "articulated segments of speech" (with which the speaker's "process units" of body motion are synchronous) and listener body movements. The role of the visual mode in interactional synchrony, while briefly acknowledged by Condon (Condon & Ogston, 1971) is not explored. Instead, Condon has come to feel that the *reason* interactional synchrony is so pervasive in human interaction is that it is intimately interrelated with auditory perceptual processes (Condon, 1979, p. 138). He has further argued—on the basis of his findings that the infant moves in synchrony with adult speech, particularly with the hierarchical organization of that speech—that interactional synchrony is a crucial factor in language acquisition (Condon, 1975; Condon & Sander, 1974a, 1974b). In his most recent writings, then, Condon stresses mechanisms of auditory perception to explain how synchrony is accomplished, not visual monitoring (Condon, 1979, pp. 138-139). Thus, it would seem that Condon's conception of interactional synchrony would allow not only mutually aligned self-synchronies (that is, speech-kinesic to speech-kinesic correspondence), but also (and perhaps most importantly) instances in which the listener's kinesic behavior corresponds with aspects of the speaker's speech.

In addition to the question of which channel or channels of communication are most important in interactional synchrony, Condon also raises a more fundamental issue about the way in which interactional synchrony is possible. To understand this issue, it is important to understand the distinction between *exogenous* and *endogenous* conceptions of the basic mechanism accounting for interactional synchrony. In the first conception, synchronous behavior in interaction occurs as a result of perceiving and responding to exogenous social stimuli in very short time intervals. In the second conception, synchronous behaviors occur as a result of endogenously-sustained tempos of interaction. No one has suggested that interactional synchrony depends upon moment-to-moment, continuous processing of external social stimuli. Condon favors an explanation which rests on the notion of rhythmic entrainment, requiring an endogenous sustaining, respectively, of an aligned tempo. As he puts it, interactional synchrony is dependent on the "listener, given initial cues, actively (entering) into the speaker's tempo" (Martin, 1972, cited in Condon, 1979, p. 139). Again, Condon asserts that the primary mechanism by which this entrainment occurs is auditory.

Summarizing Condon's work, the following points are relevant:

1. Interactional synchrony involves coordination between interactants at the level of coordinated behavior clusters or process units. It is not definable in terms of body parts treated one at a time.
2. Interactional synchrony is a by-product of auditory perception, the basic mechanism of which is some kind of endogenous rhythmic entrainment. The auditory channel is asserted by Condon to be predominant in the phenomenon.
3. Interactional synchrony is pervasive in normal human interaction.

INTERACTIONAL SYNCHRONY: KENDON'S WORK

Kendon's studies of interactional synchrony differ from Condon's principally in that Kendon is interested in identifying a communicative function of the phenomenon. Given this major concern, Kendon studies films of groups of persons in naturalistic settings rather than of dyads in laboratory settings. He is interested in discovering the contexts in which synchronous behavior occurs and does not occur, and from this distribution, he infers the communicative function. This framework is congruent with the metaphorical view of kinesic behavior as "body language."

In Kendon's first article in this area, the film used was Birdwhistell's "TRD 009, English pub scene" (Kendon, 1970, p. 104). Extracts were selected for study using Condon's method of behavioral transcription. Typical selections were question-answer exchanges (Kendon, 1970, p. 106). In this study, interactional synchrony was defined after the manner of Condon and Ogston (Kendon, 1970, pp. 103-104), and, like Condon's recent work, he suggested that interactional synchrony is made possible primarily by the auditory channel (1970, p. 122).

Unlike Condon, Kendon asserts that the underlying mechanism which explains how interactional synchrony occurs is what he calls (after Neisser, 1967) the "analysis-by-synthesis" theory of speech perception, where

> it is supposed that the listener samples input from the speaker intermittently and then, on the basis of these samples, constructs a version of the message which he then checks against later inputs. He can be said to construct a running hypothesis about what the speaker will be saying a moment hence... if we allow that cognitive processes and bodily movement are interrelated, we may expect the processes involved in the processing of speech by a listener may affect his movements or even be marked in movement. (1970, pp. 122-123)

Thus, Kendon postulates an intermittent tracking process, quite different from the rhythmic entrainment hypothesis suggested by Condon.

Kendon's main contribution to refining the notion of interactional synchrony comes from noting that there are kinds or degrees of synchronous behavior. This is part of Kendon's general interest in integrating interactional synchrony within a general framework of human nonverbal communication. In his 1973 article, he discusses many different time-scales of kinesic behavior ranging from relatively long-term postural effects to sub-second interactional synchrony. Some communicative functions of interactional synchrony seem particularly important to Kendon. For instance, in addition to the simple coincidence of process unit boundaries, it is also the case that sometimes the listener's kinesic behavior is a "mirror image" of the speaker's nonverbal behavior. In other words, the listener moves similar body parts in similar ways with those of the speaker, and these movements are synchronous with the speaker's. This "dancing the other's dance" may be thought of as interactional synchrony in a narrow sense, while Condon's definition is a relatively broad usage. Kendon suggests cases of interactional synchrony in the narrow sense have predictable distribution in conversational contexts: mirror image synchrony occurs at speaker-switching junctures. Within a general Goffmanian framework, Kendon suggests that interactional synchrony may have the function of communicating that interactants are *attending* to one another:

> Our hypothesis is that in moving synchronously with D, F shows that she is attentive to him, and this has the conse-

> quence of drawing his attention to her. (Kendon, 1973, p. 57; see also Kendon, 1970, p. 124)

Further, he suggests that the more pervasive type of synchrony which Condon studies may contribute to a general feeling of rapport between interactants (Kendon, 1970, pp. 101-102). These hypotheses lead Kendon to suggest that the most general problem to be considered is when interactional synchrony *may* arise or *may not* arise in normal interaction. In a general sense, synchrony is most marked at those points in an interaction where problems of the "delicate coordination of expectancies among participants" (1970, p. 124) arises, and, following from this assumption, where interactants are attending maximally to each other.

To summarize Kendon's work, the following points are relevant:

1. There are kinds or degrees of synchronous behavior, each of which may have a specific communicative function.
2. The central problem is to discover the conditions under which interactional synchrony may or may not occur.
3. Some specific functions interactional synchrony may have are to *regulate speaker-switching* (when "mirror synchrony" is likely to occur), to signal that interactants are *attending* to each other, and to indicate a general state of *rapport*.
4. Interactional synchrony occurs through a kind of intermittent tracking process, rather than the rhythmic entrainment suggested by Condon.

McDOWALL'S WORK ON INTERACTIONAL SYNCHRONY

As can be seen from the foregoing, Condon and Kendon not only accept the validity of interactional synchrony as a pervasive fact in interaction, but also have attempted to integrate the finding into grander schemes of the nature of human social interaction. Yet on a variety of grounds it is possible to argue that the existence of interactional synchrony, let alone its purported importance, has yet to be demonstrated (see Rosenfeld, 1981, for a more extensive critique of the literature). For example, Condon and his co-workers often state that large numbers of films of interaction have been completely analyzed for the occurrence of interactional synchrony (Condon & Ogston, 1971, claim that 50 such films have been completely analyzed); yet only fragmentary examples of synchrony are in fact published. Customary standards of scientific analysis, both in terms of research design and statistical appropriateness, are not in evidence. McDowall (1978a, 1978b) has published two studies which are the first experimental tests of the phenomenon. In these articles he puts forward two major points: (1) the basic methodology of frame-by-frame analysis is not highly replicable, and (2) the coincidence of body part movement boundaries is not greater than would be expected by chance.

If McDowall's experiments are valid tests of the phenomenon in question, then interactional synchrony is spurious not genuine, and the work predicated upon it is misguided to say the least. We do not believe that his experiments constitute such a refutation. We take his points in order.

Reliability, or replicability, in Condon's methodology of transcribing filmed behavior is a matter of the degree of inter- and intra-observer agreement in locating when a given inertial change point occurs. Two viewers of the same film footage may agree that a body part exhibits an inertial change (it initiates, terminates, or changes direction of movement), but disagree between which two consecutive frames this change occurs.

In order to determine the degree of replicability in Condon's methodology, McDowall trained four observers (other than himself) during a 24-hour program of instruction. McDowall chose 15 body parts for examination and transcription. The film was of a male participant in a three-person discussion group, and it was taken at 24 f.p.s. (McDowall, 1978a, p. 79). Each observer was given a 50-frame sample (already analyzed by McDowall) in which the movements of a given body part were to be transcribed. Each observer made a second transcription of the film segments one month after completing the first one. In this way, both inter- and intra-observer replicability could be measured.

The viewers first ran the film samples at 24 f.p.s. (i.e., at normal speed) to judge whether or not any movement in the body part occurred. If there was movement, they then viewed the segment again "slowly forward and backward until the boundaries were determined" (McDowall, 1978a, p. 80).

The findings of this reliability experiment showed that intra-observer replicability was higher than inter-observer (McDowall, 1978a, p. 81). Furthermore, it was determined that the optimum balance between observer reliability and by-chance agreement was achieved if observers considered only every third frame in their comparisons (McDowall, 1978a, p. 87). In other words, at 24 f.p.s. observer reliability was poor, and at 4 f.p.s. the increase in observer reliability was countered by the increased statistical likelihood of such agreement. Hence, 8 f.p.s. was found to be the optimal segmentation of time. These findings seem to indicate that Condon's methodology, which employes 48 f.p.s. and even higher speeds, splits hairs beyond the point of replicability.

At first reading, McDowall's arguments and results seem convincing. However, there is a major problem in extrapolating from his results to the work of Condon. The issue hinges on McDowall's phrase that film on which movement was detected was run "slowly forward and backward . . ." (p. 87). "Slowly" here means at the viewer-speed of 1 f.p.s., or 24 times slower than normal speed. This may sound slow to the uninitiated, but Condon's analyses are made by manually advanced frame-by-frame comparisons, *much* slower than 1 f.p.s. He may spend several minutes checking and rechecking for the location of movement boundaries between consecutive frames. Also, Condon transcribes *all* body part changes as he goes; he does not do a transcription of each body part taken one at a time. McDowall acknowledges that his experimental procedure is "technically different from Condon's (1970) method of manual operation" (McDowall, 1978a, p. 80), but he ignores the significance of this qualification in his concluding remarks. One may well ask whether an uncontrollable viewer-speed of 1-frame every second will not produce less reliable transcriptions than manually controlled forward and backward comparisons.

Therefore, our conclusion regarding McDowall's reliability test is that, though suggestive, it is inconclusive and perhaps irrelevant to Condon's work. The test results remain significant for anyone who intends making transcriptions from viewings having a 1-second lapse-time between frames. But, this is *not* Condon's method; hence, the results of this test are inconclusive with respect to testing Condon's methods.

McDowall's second critical test of interactional synchrony is more fundamental than his first. The question he raises is an important one:

> Can synchrony be demonstrated to be more than just a series of random occurrences? (McDowall, 1978b, p. 965)

In addition to this fundamental issue, his experimental design provides for checking three specific hypotheses regarding interactional synchrony: (1) if synchrony indicates good rapport, then we might expect that friends would be more likely to have good rapport when conversing than would strangers, and therefore be more synchronous; (2) if synchrony facilitates speaker-switching, then more synchrony would be expected between consecutive speakers than between a speaker and some other person; and (3) if synchrony facilitates speaker-switching, then we would expect more evidence of synchrony during times of rapid speaker-switching than during times of relatively long latency periods following a speech or times of overlapping speech (McDowall, 1978b, pp. 965-966).

To test these propositions and issues, McDowall filmed (at 24 f.p.s.) an arranged discussion among six participants, some of whom knew each other and some of whom did not. A questionnaire was given to the participants before the session began to secure information concerning the degree of friendship between them. Subsequent to the filming, the entire film was transcribed after the fashion described above (i.e., each frame was viewed at a rate of 1 f.p.s. and movement boundaries indicated in a matrix with an X).

As mentioned, this procedure differs from Condon's both in the consideration of how long a viewer may examine one frame before going on to the next and in that a single body part is charted in totality before analyzing another body part (cf. McDowall, 1978b, p. 967). But the most amazing discrepancy is that McDowall did not add speech behavior to the behavioral transcription:

> I chose to investigate only the body-movement coordination between interactants. This alone is still an accepted indicator of interactional synchrony. (McDowall, 1978b, p. 963)

His claim that kinesic behavior by itself is "an accepted indicator" is supported by a footnote to Condon and Ogston (1967a, p. 230). This citation comes from a point in that article where they are answering a possible objection that interactional synchrony may be nothing more than an effect of motion picture cameras. However, this paragraph also ends with the following sentence:

> These changes are also, again, occurring at distinguishable points of *phonetic* change. (Condon & Ogston, 1967a, p. 232, emphasis ours)

Having decided to consider only kinesic behavior, McDowall computes the overall incidence of interactional synchrony in the following manner. The chart for each participant's movements of eighteen body parts was condensed into a single chart showing on which frames in the 1000-frames sample at least one body part has changed inertial state (McDowall, 1978b, p. 967). All possible combinations of interactants were analyzed for interactional synchrony according to the 3-frame unit of analysis (this decided on the basis of his earlier reliability experiment). Seemingly, deciding to adopt a 3-frame unit of analysis is operationalized not by filming the interaction at 8 f.p.s., but rather by using every third frame of a 24 f.p.s. film. The result is that the 1000-frame sample ends up as 333 three-frame units (cf. McDowall, 1978b, p. 968).

In his experiment, an instance of interactional synchrony is awarded in cases where each interactant being considered has an inertial change-point in some part of his or her body at the same time as others in the comparison. The results of tabulating observed cases of such "synchrony" and comparing this number with expected frequencies of coincidence do not support the advocates of interactional synchrony. That is, "synchrony" seldom occurs at greater than statistically expectable frequencies. McDowall concludes that:

> Results from this data sample suggest that interactional synchrony is *not* a fundamental characteristic of human behavior, occurring constantly during normal interaction, as claimed by Condon and Ogston (1971). (McDowall, 1978b, p. 972)

Furthermore, all three specific hypotheses concerning the communicative function(s) were not supported by the experimental findings. The first and second hypotheses were clearly not supported, and the third was hard to interpret because the overall incidence of inertial changes increased during short-latency speaker-switching locations (as hypothesized) but this was not statistically significant (McDowall, 1978b, p. 973).

The final conclusion of McDowall's article is a strong rebuttal of the work of Condon and Kendon.

> Although interactional synchrony was recorded at greater than chance occurrence (in a few of the many comparisons), these instances were so infrequent and sporadic that any attempt at a functional interpretation would be extremely tenuous. This is a totally different picture from that presented by Condon and Ogston (1966, 1967b [1967a]), where synchrony was seen as a findamental characteristic of normal human interaction. (McDowall, 1978b, p. 974)

We find McDowall's second experiment confusing and hard to relate to the work of Condon and Kendon. We suggest that his behavioral transcriptions are noncomparable with those he claims to be testing; hence, they are not tests of "interactional synchrony" at all. Our argument rests on noting the following discrepancies:

1. McDowall assumes that each and every kinesic movement-boundary (inertial change-point) should be pertinent to identifying interactional synchrony. This view totally ignores Kendon's narrow sense of the concept, and it misses one of Condon's main points: that interactional synchrony consists in the temporal alignment of the boundaries of *process units,* not single body part changes.
2. McDowall assumes that if persons are hearing the same speaker, then their kinesic behaviors will necessarily coincide temporally with the kinesic behavior of others in the gathering. Thus, he operationally defines interactional synchrony as mutuality of kinesic change points, and he considers non-mutuality of such kinesic (only) changes to indicate non-synchrony.

We discuss these two points in order.

In choosing to represent each interactant's body movements in a simplified flow chart, McDowall confuses the meaning of interactional synchrony as it was originally defined. For him, a frame in which a person moves an elbow and another person his foot is just as much an instance of interactional synchrony as when two persons "dance one another's dance" à la Kendon. Conversely, should non-axial participants in a conversation exhibit sequentially triggered flow in their respective movements and all in synchrony with the speaker's speech, this would be missed and relegated as instances of non-synchronous behaviors. In other words, what is conspicuously absent in McDowall's second test is any regard for the concept of process units, which, as we have already seen, is completely fundamental.

Figure 1 illustrates the kind of discrepant results his "simplified" transcription will yield as compared with the typical Condon transcription. Here, we illustrate an hypothetical case.

The examples Condon presents always show high redundancy in change point alignment. It is the correspondence of such high redundancy change points between two interactants which identifies interactional synchrony. McDowall's simplified behavioral tran-

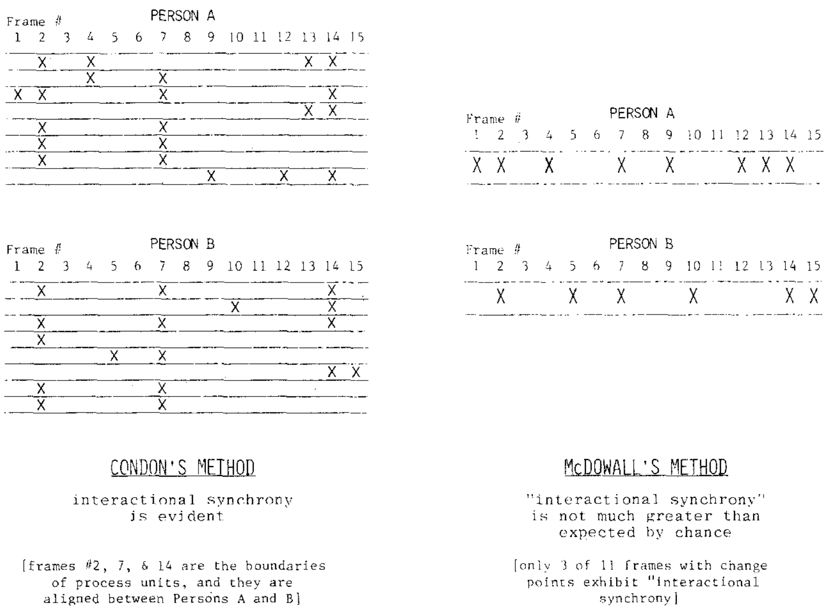

FIGURE 1. A comparison of Condon's and McDowall's methods of transcribing filmed behavior: how failure to incorporate the idea of process units can lead to errors in the identification of interactional synchrony.

scripts eliminate the criterion of redundancy and the concern for identifying units of behavior which motivates Condon's analyses. In place of these, McDowall substitutes a simple tabulation of frames exhibiting alignment of X-number of body parts versus frames not showing alignment of X-number body parts.

In defense of McDowall's process of simplifying kinesic charts, it should be noted that Condon himself has illustrated examples in this fashion (e.g., Condon & Ogston, 1967a, pp. 231-233). But, these simplifications follow after the full-blown transcription techniques have already been presented. Even in these cases, Condon always includes speech change points in his illustrations.

This leads us to our second point. Condon's whole direction of research from 1966 onwards indicates a stand that kinesic behavior and speech are inextricably intertwined. Not once does he put forward the notion that interacting persons exhibit a mutual alignment of kinesic behavior without the intermediary of mutual speech stimuli. This position is absolutely clear in his recent work in which he plays tape-recordings of adult speech (i.e., no visual channel information) to 2-week old infants and observes the neonates move in synchrony with the recorded speech. Hence, McDowall could not have gotten the idea of omitting sound track transcriptions from the work of Condon.

Kendon, however, comes close to saying that synchrony may be observable by examination of kinesic behavior only. This arises as he summarizes the behavior of non-axial participants in a group discussion. One example consists of two persons, both of whom are non-principal listeners of a speaker.

> It is as if they are both dancing to the same beat, though the movements they make are quite different. . . . They are now both attending to T and, in doing so they both move synchronously with him and hence synchronously with each other. (Kendon, 1970, p. 120)

Perhaps this was the basis of McDowall choosing not to add speech change points to his kinesic transcriptions. However, on the next page, Kendon continues his discussion:

> Often such actions by non-axial participants are not simultaneous, but they occur in sequence, as if each triggers the next. This seems to occur in particular where only some of the non-axial participants are attending to an axis which changes, while others are attending elsewhere. (Kendon, 1970, p. 121)

Therefore, Kendon does *not* support the notion that interactional synchrony can be observed independent of the congruence of kinesic and speech segments.

Figure 2 illustrates how McDowall's method of documenting interactional synchrony using kinesic behavior only can go amiss. The inertial change-points in the kinesic behavior of listeners A and B are aligned with one another only twice in the seven frames in which some movement-change occurs. The conclusion from this application of McDowall's method would be that interactional synchrony between A and B is minimal. However, if the transcript includes a segmentation of the speaker's speech, then it is clear that both A and B are harmoniously synchronized with one another through the intermediary of the mutual, speech stimuli. Condon and Kendon would here speak of interactional synchrony in the kinesic behavior of A and B, but McDowall would report that it was not greater than expected by chance. Therefore, pre-

Frame #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
PERSON A's KINESIC CHANGE POINTS		X					X									X				X			
PERSON B's KINESIC CHANGE POINTS				X			X					X				X							X

Frame #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
SPEAKER'S SPEECH		X		X			X		X			X			X	X				X			X

FIGURE 2. An illustration of the difference between kinesic-kinesic and speech-kinesic comparisons: how interactants may exhibit synchrony with the speech of the speaker but show non-alignment with each other's kinesic movements.

suming to test interactional synchrony by considering only kinesic behavior (i.e., only the video portion of the film) is unsound.

In effect, McDowall redefines "interactional synchrony," tests his concept with respect to claims made of the original concept, finds negative results, and then says that interactional synchrony is spurious. We suggest that McDowall's experiments, both of them, are irrelevant to the work of Condon and Kendon; that is, they fail as tests of the proposed phenomenon.

SUMMARY

Researchers doing micro-analysis of filmed behavior have been slow to examine critically one of the more significant findings in the area—interaction synchrony. First proposed in 1966, it was only in 1978 that experimental tests of the phenomenon were published. Furthermore, these experiments by McDowall were based on methodologies not comparable with those of Condon and Kendon. Therefore, we submit that no pertinent test has been made of the phenomenon.

Before the phenomenon can be tested, we feel some confusion in its definition needs to be cleared away. Thus, we summarized the work of Condon, the major proponent of interactional synchrony, and of Kendon. Then, we noted differences between the assumptions of McDowall's experiments and interactional synchrony as propounded by Condon and Kendon.

The issues in this field of research are as follows: (1) methodological reliability; (2) empirical validity of the phenomenon; (3) questions of how synchronous behavior is possible; and (4) the effects of attention and rapport on the occurrence and/or character of synchronous behavior. These four areas build upon one another in steps, that is, reliability issues should be dealt with first, before going on to attention and rapport effects.

We hope our efforts to clarify and sharpen research directions will involve others in this field. Micro-analysis is very time consuming. Only by coordinating research efforts, making methodologies more comparable, and specifying the real issues will further progress be made beyond the highly suggestive and persistent work of Condon.

Reference Note

1. It is important to note that Condon is interested in an analysis of the speech stream at the "etic" level, in Pike's sense of that term (1954). That is, as Condon and Ogston put it (1967a), an "etic" approach involves "an analysis of the physical elements which cooperate in the articulation of sounds as against an analysis of which sounds will be functioning in a given language and in what ways" (p. 222). Pike calls the latter approach "emic" (1954). Sound units are built up in a manner congruent with the inductive approach used by Condon and Ogston to define kinesic units.

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