### MOVEMENT BEHAVIOR ASSESSMENT (MBA) -- Profile Analysis

<table>
<thead>
<tr>
<th>Patient</th>
<th>Session</th>
<th>Coder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsystem involved</td>
<td>Pathology Category</td>
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</tr>
<tr>
<td>I</td>
<td>DISORGANIZATION</td>
<td>0 1 2 3</td>
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<td>II</td>
<td>IMMOBILITY</td>
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<tr>
<td>III</td>
<td>LOW VITALITY</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>IV</td>
<td>LOW SPATIAL COMPLEXITY</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>V</td>
<td>PERSEVERATION/FIXED-INVARIANT</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>VI</td>
<td>FLACCIDITY OR RETARDATION</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>VII</td>
<td>DIFFUSION</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>VIII</td>
<td>EXAGGERATION</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>IX</td>
<td>HYPERKINESIS</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>X</td>
<td>EVEN CONTROL/SUSPENSION</td>
<td>0 1 2 3</td>
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</tbody>
</table>

**Limited Communicative Repertoire**

| 0 | 1 | 2 | 3 |

**Scoring key for MBA Categories I - X:**
- **0** = none observed
- **1** = presence of "less serious" features
- **2** = low incidence of "pathognomonic" features
- **3** = moderate to high degree of "pathognomonic" features

**Scoring key for Limited Communicative Repertoire:**
- **0** = some speech gestures, head movements, facial expression and clear orienting to other
- **1** = some restriction in orientating, facial, gestures, head moves with listening and speech.
- **2** = marked restriction
- **3** = severe restriction

A. GESTICULATIONS [ ] B. SELF-RELATED [ ] C. INSTRUMENTAL [ ] D. ORIENTING [ ] E. HEAD [ ] F. FACIAL [ ]
G. LOCOMOTION, POSITIONS [ ] H. INVOLUNTARY [ ]
I. ADDITIONAL MED. SYMPTOMS [ ]

**Subsystem Pathology Key:**
- **0** = none observed
- **+** = some observed
- **Z** = data unavailable

[ ] Viewing conditions adequate (e.g. 35+ mins/med. shot)
[ ] Viewing conditions inadequate

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GUIDE TO MOVEMENT ANALYSIS METHODS

by Martha Davis, Ph.D.
New York State Psychiatric Institute

Part 1: MOVEMENT SIGNATURE ANALYSIS

MSA

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Not for use or quotation without permission of the author. Correspondence should be sent to Martha Davis, 1 West 85th Street, 1A, New York, New York 10024. This guide is a supplement to the training and practice necessary for reliable coding and analysis. The guide alone is insufficient for learning the method.
GUIDE TO MOVEMENT ANALYSIS METHODS:

PART 1 MOVEMENT SIGNATURE ANALYSIS

by Martha Davis, Ph.D.

Movement Signature Analysis (MSA) is a method for identifying, recording and analyzing individual movement style. It is both a method and a specific coding system: i.e., a set of steps or procedures for discovering how an individual's movements are uniquely patterned and a set of terms and notations designed for coding the nonverbal behavior that accompanies speaking.*

The method evolved from research by the author on individual movement patterns and dyadic interaction analysis (Davis, 1972; 1975; 1977; 1991); and is influenced by the observational methods of Efron (1941/1972) and Schefflen (1973). While it does not require prior training in Laban Movement Analysis (Laban & Lawrence, 1947; Hutchinson, 1970; Bartenieff with Lewis, 1980), some aspects of the coding are derived from the Laban movement analysis tradition, so LMA training should facilitate learning Movement Signature Analysis. The MSA method could not have been successfully completed without the contributions of Dianne Dulicai (Davis & Dulicai, in press).

Conceptually, Movement Signature Analysis is based on the assumption that individuals have unique ways of moving that pervade various contexts and are the result of many factors, from innate ones such as are reflected in the newborn "activity type" to acquired patterns associated with social role, gender, and cultural identity. However, relationships between individual movement patterns and personality, image projection, cultural identity, or self-perception are appropriately the subject of research. All that is essential for a Movement Signature Analysis per se is that the discriminations be fine-grained and particularized enough to identify individuals, not groups. Movement patterns identified through the method are structured and patterned so precisely, that they are more appropriately called "signature patterns" than traits or tendencies. It follows from this that inventories and rating sheets are inadequate for identifying the unique ways in which the individual moves. There must be a replicable method for identifying patterns, and it is assumed here that microanalysis of selected movement phrases is the most promising way to achieve this.

Optimally, observers completing a Movement Signature Analysis work in pairs because they can cross-check impressions with each other and divide up tedious parts of the task. Pairs can challenge each other to define what they see even more explicitly and accurately. The analysis progresses through six stages:

1 SELECTING SEGMENTS FOR MICROANALYSIS
2 DEFINING INDIVIDUAL CODES
3 RECORDING THE SEGMENT(S)
4 PATTERN IDENTIFICATION
5 SUMMARY AND COMPARISON
6 INTERPRETATION/PREDICTION

*Theoretically, it should be possible to develop MSA coding for non-speaking contexts such as dance similar in many ways to the coding to be presented. It would be a Movement Signature Analysis if it were based on the set of steps to be described and if it used similar criteria for defining beginning and ends of continuous segments, involved pattern analysis of many movement variables in relation to each other, and made discriminations fine enough to capture individual, not group, differences in movement style.
STAGE 1: Selecting Segments for Microanalysis

The procedure begins with selection of the film or videotape of the subject that is the best one can obtain. Criteria for session selection may vary, e.g. it is a recording of the context of primary interest, is a particularly important example, is the only good footage on the subject available, etc. Segments are then selected from this recording for the microanalysis. Final selection is often determined by the quality of the film or video. It must show the subject in at least a hip to head shot throughout the entire speech gesticulation. Most important, the movement must not be interrupted by cuts or changes in camera shot. One has either to supervise camera work to insure continuous, full or medium shots, or search available material for usable footage.

The time in minutes and seconds must be superimposed on the videotape to facilitate the microanalysis. Actual recordings should be accurate to half a second. For most purposes, greater accuracy is not necessary because it is the sequencing and combination of details that is important, not duration in clock time.

SEGMENT DEFINITION: The unit of study is continuous gesticulating bounded by still positions or changes in activity. The beginning of the gesticulation is defined as the start from a “rest” or “homebase” position in which the limbs are supported and the ending is marked by return back to a “homebase” position of the upper limbs. “Homebase” positions which demarcate a gesticulation segment should be held still for at least four seconds. The exception to this rule involves sequences that start and/or end with an activity other then speech gesturing (e.g. gesticulating then lighting a cigarette). In other words, the search is for passages of speech-related activity (including position shifts, changes in focus, preparatory actions, as well as gesticulations) that can be demarcated by still positions or changes in the type of activity. Note that it is not only possible but common for a segment to contain a string of “movement phrases” demarcated by very brief returns to homebase positions. Homebase positions must be held for 4 seconds or more to mark the beginning and end of the segment. But the subject may and often does “glancingly” touch homebase and return to gesticulating, in effect defining shorter phrases strung together within the segment itself.

SEGMENT TYPES: At least three types of segments need to be collected for a thorough Signature Analysis: 1) a representative of the simplest, most limited movements that accompany the subject’s speech for a baseline, 2) a segment of mid-range complexity and length, and 3) an example of the longest, most complex and elaborate speech-related movement displayed:

1) Simplest—First search for an example of how the individual speaks at his or her lowest level of activity for a baseline. This should be a speaking turn in which there is no postural movement or position changes. If such turns also display no gesticulations, than this is the choice. Otherwise choose a turn in which the gesticulating is shortest (one or two changes in direction), involves the smallest upper limb unit (usually hand or forearm-hand), shows the least intensity (no distinct changes in time or force), and is spatially simplest (in and out or barely projecting into a direction before returning to homebase).

2) Mid-range—This refers to a sample of speech-related movement that is between what is simplest and most complex for that subject. Potentially, there are at least four types of mid-range segments that may be chosen for microanalysis:

   2a Mid-range/repetitive: an example of the way in which the subject is repetitive through all or most of a segment. Usually this will be two-phasic, back and forth gesticulations, but if not, select a segment containing a string of repetitive movements what is representative of the individual’s repertoire.
2b Mid-range/high intensity: maximal display of intensity (changes of force and time, whole body activation, direct or indirect approach to space) within a short or medium length segment.

2c Mid-range/preferred type: the individual may continually display a particular gesticulation type. Definitions and terms for gesture types are adapted from Efron (1941/1972). For example, a "baton" would be gesticulation that primarily relates to the stress pattern or beat of the speech.

2d Mid-range/pathology: a segment that includes signs of how, if at all, the person displays marked constriction, disorganization or other forms of motor pathology as defined in the Movement Psychodiagnostic Inventory (See this Guide, Part 3).

2e Mid-range/special pattern: if there is any other type of pattern not covered above but judged by the observer to be distinctive and important to the movement style of the subject, a special category can be defined and included. For example, the individual may have a distinctive way of mixing self-touch actions within short or mid-range gesticulating sequences.

3) Most complex: This is a gesticulation segment that has the most complex pattern of laterality, body part units, intensity variation and spatial projection.

While theoretically, these criteria could result in many specimens, in practice, one elaborate segment may display several features, such that it alone can generate many discoveries about how the individual combined sequences various dimensions of movement. Because microanalysis is time-consuming, the selection of specimens should be restrained by the rule: include it only if it reveals important patterns not visible in other samples.

STAGE 2. Defining Individual Codes

Figure 1 lists the sixteen categories of the Movement Signature Analysis coding developed for speaking behavior. The General Key is both a list of definitions and a reference sheet for coding. However, the definitions are only the first "approximation" for recording an individual's movement. They are the basis for STAGE 2 which involves tailoring the General categories to the specific variations of the individual. Once the specimens are selected for microanalysis, they are scanned several times to define any special variations of the features listed in the General Key. These variations are recorded in an "Individual Signature Key" (see Figure 2). Unless a special variant is noted in this section, notations in the recording are assumed to be as defined in the General Key.

A segment of gesticulating displayed by Michael Dukakis during the first 1988 U. S. presidential debate will be used to illustrate the procedures (Figure 2 and 3). Note that in the Individual Key, notation is made of each target of visual regard (e.g. straight in front toward the camera or right toward, but not quite at, Bush), trunk orientation (e.g. frontal), ways of holding hands during gesticulations (e.g. right thumb under forefinger in a near-fist), etc. Combinations of types of gesticulation should also be spelled out here.

STAGE 3. Recording the segment

To obtain a detailed recording of the actual phrasing of the movement segment, observers should examine the sample in slow motion, freeze frame, at regular speed, whatever viewing method that works for them. For example, stop-frame facilitates recording positions; slow motion aids examination of body part articulations; judgment of time and force variation requires regular speed. Some aspects will be easy to record, others may be ambiguous and difficult. While hard-to-observe aspects can make the task frustrating, they often turn out to be the most important leads to the unique ways in which the individual moves.
STAGE 4. Pattern Identification

By now the pair has seen the segment many times and has begun to identify clusters, combinations, distinctive variations. The principal function of such a detailed recording is to facilitate this pattern identification. A search for "signature patterns" does not mean finding a pattern that is exactly duplicated each time. It is a search for set combinations and sequences that are embedded within the passage, although each time one sees the pattern it may be part of a different action or be combined with different features. There are guidelines for identifying these patterns:

a) How a movement is varied is more important than what is done. For example, "looks to camera, looks at interviewer, looks at partner" is less important than identification of differences in how the subject varies the gaze, sequences the gaze direction, paces the changes, or combines a particular gaze pattern with other aspects of the nonverbal behavior. Recording of functional actions is done to facilitate identification of the manner of their performance; "what is done" becomes the hook on which to "hang" and locate the qualitative and structural patterns.

b) Attend to initiations and endings such as the precise way in which a change in direction is performed. Similarly, distinctive patterns may be detected by examining how transitions are made from one phase to another.

c) Study how the emphasis is patterned. Is there a distinctive rhythm detectable in repetitive movements? Is there a notable way in which the segment develops in terms of time and force changes?

d) Shift focus fluidly from study of patterns within the various categories to between categories; e.g. look for repeated sequences of body part articulation then "pan back" to search for relationships between this and the gesticulation type, the position shifting, the gaze direction. The patterns should be circled on the recording and described in detail at the bottom of the recording sheet.

The primary purpose of such scans is to make discoveries. By definition what is being searched for are not patterns that one has already seen in others, but patterns that are unique. However systematic and explicit the procedure, there is always an element of unpredictability. A Signature Analysis should result in discovery and unanticipated results; it should facilitate new perceptions that do not contradict, but rather refine and expand initial impressions.

STAGE 5: Summary and Comparison

Once the recording of a segment is complete, the observer tallies the variations in each category onto the Summary sheet (Figure 4). Any specific combinations or sequences circled on the recording sheet are listed on the Summary sheet as well. The Summary provides information on the proportion of certain features in relation to each other (e.g. in the Dukakis segment, instances of strong, direct and sudden variations occur in a particular proportion to each other while definite examples of light, indirect and sustained dynamics are absent.) As such it provides additional information on individual movement style.

The Summary sheet generates quantitative data useful for observer reliability assessment. If observers have been working in pairs, assessment of observer agreement can be done by comparing the observations of pairs rather than individuals. The Summary sheet/inventory can also be used to examine the extent to which the patterns are found in other samples and contexts.
STAGE 6: Interpretation and Hypothesis Testing

As much as possible, the observers should work without hearing the sound and with minimal information about the individual. Any analysis of speech/motion relationships is to be done after the Signature Analysis is completed. The greater part of the MSA effort is not interpretation, but identification of patterns in movement terms using a minimal degree of inference. The discovery of motifs and structural and dynamic details that are individually distinctive is the goal. However, after defining the patterns, assessing observer reliability, and studying whether these patterns persist in other samples and contexts, there are obviously many questions which may be pursued and many problems to which the MSA might be applied. The final stage may well involve some prediction and/or interpretation of the patterns. However, while a research project may, of course, be constructed to test certain hypotheses and predictions, care must be taken not to influence or direct the MSA itself with a priori assumptions and designs. As much as possible the observers must attend to what the movement shows and not "force" information from it that is not backed up by visible evidence.

It should be clarified that the "grosser aspects" of the recording are not what are being called here "signature patterns". While it may be that types of facial expression, or where a person focuses and orients are individually consistent, these categories are regarded as very "soft signs" of individual style, highly sensitive to context and cultural variation. Recording them is a device for organizing observation of the more micro qualitative and structural patterning of movement which is the domain of a Signature Analysis.

Movement Signature Analysis is primarily a microanalytic procedure, not a fixed coding system. While the General Key contains specific categories coded in a particular way, it is not the codes that are being proposed so much as the method and the steps outlined above. Theoretically, any aspect of nonverbal behavior, including some not included in the General Key such as finer variations in tension flow, could be part of a Signature Analysis. The basic steps--1) Segment selection, 2) Individualizing the General codes, 3) Micro recording of each selected segment, 4) Search for "signature patterns", 5) Summary analysis and comparison with other examples--are what is referred to here as a Movement Signature Analysis.
As can be seen in the General Key (Figure 1), MSA coding has many symbols—some adapted from Labanotation (Hutchinson, 1970), some from effort analysis (Bartenieff with Lewis, 1980) and some pictographic or letter symbols devised for this coding. Conceivably, one could do an entire MSA with verbal descriptions alone, although it would be cumbersome and much more difficult to visualize the patterns. As long as each variation is operationally defined and the record is legible, a verbal record is viable. However, as formidable as the symbols appear at first, they are very handy and easy to learn. Ultimately they save a great deal of time and facilitate discoveries of patterns.

In this section each category will be described in greater detail and will include observation and recording pointers. The General Key is designed to be a quick reference accompanying the recording sheets for the Individual Key, segment recording, and Summary Analysis. On the top of each recording sheet, the name of the subject, the context or source of the segment, the time interval, and observer name(s) are recorded. To illustrate the recording and analysis procedure in more detail, complex gesticulation segments of Michael Dukakis and George Bush from the first 1988 U.S. presidential debate will be used.

CATEGORY 1: Facial Expression

Reliable judgment of facial expressions in affect terms requires some training or preparation. Observers are likely to vary in the terms they ascribe to a facial expression, although their choices may show marked similarities. Consider, for example, the terms four observers used for Dukakis' facial expression in the sample segment: "serious", "sincere/firm", "tense/ slight smile", "neutral". For projects that need great accuracy in judgment of the type of expression, there are existing coding methods that one can study (e.g. Ekman, Friesen & Tompkins, 1971; Izard, 1979). For the structural and stylistic analysis that is the effort here, which facial expression is less important than when, to what degree, and with what other nonverbal behaviors. Facial expression as well as any facial movements beyond those required for speech production per se are of interest as part of the total body organization, potentially varying and coordinating with other nonverbal dimensions. And as with other aspects of nonverbal behavior, it is assumed here that the facial movement patterns are individually distinctive even as they vary with context, mood, and speech content.

In the Dukakis example mentioned above, the four observers agreed that there was no distinct, "fully-formed" expression and no change throughout the segment. So while Dukakis' tendency to lick his lips might be part of some articulation pattern such as punctuating a verbal phrase, his facial expression was low in intensity and unvarying throughout the animated gesticulation. Whether this pattern persists through other speech segments and contexts is then a question to be researched.

CATEGORIES 2, 3: Gaze Direction and Head Movements

If you have a videotape in which the subject is only seen in close-up, you need not despair—there is still the patterning of face, gaze and head movements during speech, fascinating categories considered from the perspective of individual style. Obviously gaze and head movements are tied to the context, who is being addressed, and the stress patterns and organization of the speech. But while they are important parts of the address and speech articulation "sub-systems", they may also be studied in terms of individual patterning.

To illustrate, compare the gaze and head movement patterns of Bush and Dukakis in the First debate. Note that while both are speaking for about the same length and are very animated, the patterns are dramatically different:
Most of the time, of course, changes in gaze direction involve some movement of the head in the same direction. A great deal of gaze change not accompanied by head moves in the direction of the gaze creates the impression of being "shifty-eyed". In MSA recording, "GD" means the head movement accompanies the gaze direction. Note that the head turn may be very slight. If all changes in gaze direction are accompanied by a head turn, then one may note this in the Individual Key and avoid cluttering the record with a redundant symbol. However, this should not be forgotten in the Summary Analysis, and careful examination should be done to confirm that there are no exceptions.

Speakers may display various types of head moves besides those supporting visual behavior. It is not uncommon for the speaker to perform a series of up-down or side-to-side shakes of the head. We may be more aware when a listener head-shakes "yes" or "no", but individuals often display this during speech as well, some underlining their speech with continual head shaking. Also common are "baton-like" actions of the head in which one or more directions are stressed in such a way as to support the speech emphasis pattern. Often the direction stressed is downward, but potentially it could be any direction or series of directions. Changes in intensity, particularly time and force changes, may also be an additional dimension of the speech articulation and emphasis. Dukakis displays downward head moves without marked time or force dynamics that coincide with downward hand gestures and vocalic emphasis, a common pattern. What is distinctive is that his head moves are very small, his gaze held, and there is a slight head tilt held throughout the segment. In the selected segments, George Bush's gaze and head movement patterns are radically different from those of Dukakis.

### CATEGORIES 4, 5: Trunk Orientation and Weight Shift, Postural Shift, Trunk Shape

A speaker is likely to orient his or her body toward the listener with trunk or torso vis-a-vis the listener. However, speakers can vary this greatly, for example, turning the lower body slightly away while the upper torso is "facing" the listener. Within complex gesticulations, especially in contexts in which the speaker is addressing several people, the orientation may vary and this pattern may reveal individual differences.

Weight shifts are sometimes related to trunk orientation, but this is a category with distinctive properties of its own. Note is made in the MSA when the center of weight is displaced, as in leaning forward or shifting from one foot to the other. Trunk orientation and weight shifts are recorded with the same torso symbols for distinguishing upper torso, lower torso or whole trunk when it moves as a unit. For orientation, this symbol is combined with an address sign to indicate "facing" who or what. For weight shift, it is combined with a simple direction arrow for the direction of the shift.

"Postural" movement refers to the phase in which the entire body is active and mobilized. This can occur in diverse actions, e.g. during a position shift or at some point in a gesticulation in which the body becomes totally activated (however small the movement). Note that for all the position changes and weight shifting in the Bush example, they do not necessarily include "postural" shifts.
"Trunk Shape" refers to any held configuration of the torso, whether displayed throughout the entire segment or for a phase of it. If there is no distinctive "shape" (e.g., convex, concave, narrow, wide, etc.), then nothing would be recorded. In the Dukakis/Bush examples, Bush does not display any distinctive "Trunk Shape", while Dukakis has a way of sloping his shoulders without making his upper trunk convex or stooped.

For those interested in analysis of "Body Attitude", note that this category refers to held trunk shapes, not to degree of trunk tension or marked spatial and dynamic stresses. Any indication of these has to be very pronounced to be recorded in the Individual Key and added to this row of notations. For example, if the observer notes that the subject has a way of "carrying" his or her weight, e.g., up and back, this should be described carefully in the Individual Key. But only if it is very pronounced, because such distinctions are difficult for observers to agree on unless they are marked.

CATEGORY 6: Positions

"Homebase" has been defined as the "rest" position of the body that is maintained for four seconds or longer. Usually, each segment begins with a homebase position (see the HB column on the recording) and ends in the same HB, a new one or a new functional activity. However, as the Dukakis segment of Figure 3 illustrates, many segments can be punctuated by momentary, "near-returns" to a position. These are recorded in a pictographic way and labeled (HB) with vertical hatched lines down the recording. In effect, they demarcate smaller units of the segment and often they mark changes in gesticulation type or dynamic phrasing.

A Technical Note: One dilemma of movement notation is whether to record right and left relative to the mover or to the observer. Figure 1, the General Key, presents the body part notation and direction arrows consistent with the Labanotation convention of recording body part or direction relative to the mover, i.e., right means the speaker's right not the observer's right. However, this becomes very awkward when drawing pictographs of the speaker positions that are more static. It is easier to draw them as seen (i.e., what is left to one viewing or drawing the picture is the subject's right side). In order not to distort the Labanotation symbols and conflict with the experience of those observers trained in Laban Movement Analysis, MSA coding also requires that direction and body part be recorded relative to the mover. However, I would ask the indulgence of Labanotation experts who might well wince at this, to make an exception for the pictographs of position. As long as it is clearly noted with a small R on the pictograph to indicate the subject's right, it is acceptable to draw the positions as you see them. Absence of the letter R means you are recording them from the perspective of the speaker, just as the body part and direction notation should be done throughout. Hopefully, this will work. The operative principal is, "identify" with the movement, recording body part and direction as if you were moving like the speaker when you write it down, but you can "sit back" and draw the position as you see it (if you always note R on the pictograph so that there is no confusion in reading the recording).

Note that sometimes a speaker may pause in the air with hands held up against gravity for quite long periods. This would be recorded as a pause that is part of the gesticulation, not a position.
CATEGORY 7: Gesticulation

While theoretically a Movement Signature Analysis could be done for non-speaking types of movement, it is speech gestures that are the focus here. While speech gesticulation is richly varied by context, convention and topic, it is also a notable source of information about how individuals pattern their movements. Times in which the individual is "full out" relative to his or her range of animation and gesticulation, are particularly rich sources of information about an individual’s movement style. As the MSA coding illustrates, these moments are assumed to be accompanied by all sorts of changes, not just hand gestures, making it possible to examine exactly how gaze, orientation, head movements, posture and gesticulation are interrelated and patterned. In keeping with the notion that it is easier to record structural and dynamic variations after recording "what is done", gesticulation begins with a listing of the types of gesticulations one may display. The observer must scan the gesticulation for relatively discrete forms, many of which can be labeled with nouns or action terms found in vernacular English. For example, one of the most common gestures one may make while speaking is to simply wave or toss the hand back and forth. "I" refers to waves, tosses, "flips" of the hand or hand and arm, either in a circle or back and forth, in one alternation or in a continuous series. The next category, "II", refers to gestures in which the speaker indicates someone or something actually present with an action such as pointing at the other. "III" refers to a very common form of gesticulation, what Efron has called a Baton, in which the upper limb primarily marks the "beat of the speech. "IV" refers to "physiographic" gesticulations (Efron, 1941/1972, p. 96) that clearly depict the form of an object, a spatial relationship, or a physical action. Efron distinguishes types of physiographic gestures, but in MSA the recording need only note "IV", the general physiographic type, and assign a verbal label of what it looks like, e.g. hits hand, indicates how large, outlines the shape of an object, etc. "V" is called in MSA ideo/elaboration and is similar to what Efron calls ideographic or "logico-topographic", sketching the "paths of the thought-pattern" in the air (Efron, 1941/1972, p. 96). In reality, gesticulations are not so neatly performed as these categories suggest. The observer has to be free to describe combinations or ambiguous cases that may be difficult to categorize this way. "Combinations" would be gestures simultaneously displaying two or more types, not segments with a string of different types, one after the other. Note in the examples of Dukakis and Bush below that Dukakis primarily uses "batons" (III) or combinations of III with other types, such as a gesture that has a distinct out-in-out-in beat pattern (III) combined with gaze and direction change toward Bush as if to indicate him (II) combined with a hand action resembling a toss (I). It is ambiguous and so is recorded here as a combination (III-II-I). Bush displays a variety of physiographic gestures some of which are hard to categorize for a different reason. In Bush's segment, moves such as "smooths" or "spreads" as if over a surface, are tentatively labeled as such because they are interrupted. Bush may change mid-gesture from one to another type of gesture, earning an additional notation for interruption (§ ).
Category 7 has space to record which upper limb unit(s) are involved in the
gesticulation and in what sequence. Note that the traditional Labanotation symbols for
limbs are used here to mean the part which is active at a given moment. Often
gesticulations are performed with the whole arm raised as a unit from the homebase
position. If the hand "goes into a configuration" during the arm raise, you do not need to
write whole arm with separate hand activation (it will be assumed in Category 8, hand
configuration, to be described). However if, during the gesticulation proper, there is
variation in which part of the limb(s) is active, e.g. the hand moving, then the forearm as
a unit, then the hand articulating within a forearm movement, etc. these should be
recorded in sequence according to when the changes occur.

CATEGORY 8: Hand Configuration

If you watch someone gesticulate, you may see moments in which the individual
holds the hand in a particular configuration, e.g. points the finger and then does a series
of baton gestures or places open hands in front, palms facing and performs a series of
illustrative actions in which the hands stay in the same configuration as the arms move
in and out or up and down, etc. This category refers only to clear and definite
configurations of the hand that are maintained for at least two seconds. If the person
articulates the hands or the hands become mobile within the arm action, nothing is
noted here. For example, loose tosses or waving actions in which the hand is vaguely
moved would not be included here. While the notation may seem arcane for this, it is
actually one of the easiest details to see, so if all else fails, one can draw the configur­
ation or include pictures of the individual’s repertoire of hand configurations for clarity.

CATEGORY 9: Direction

Change in direction is the smallest "functional" unit of this recording. When recorded
in the direction row (#9), it refers to changes in direction of the gesticulation. But as
already noted, direction arrows can also be used for head movements and weight shifts.
Note that direction is considered in its simplest sense here: where in space the
movement is going relative to the mover’s upright body. (If one is recording an
individual in a prone position, it would make sense to use Labanotation symbol
conventions for this special case. See Hutchinson, 1970)

Once positions, types of gestures and active body part(s) are recorded, it becomes
easy to record the changes in direction with the simple arrow notation. While care
should be taken to accurately identify each direction, the principle function of recording
direction change is to have small, easily identified units on which to locate the qualitative
distinctions which will be made in categories 11, 12 and 13. The microanalysis of
exactly how these changes in direction are performed becomes the more essential part
of the individual Signature Analysis.

The Dukakis and Bush examples below illustrate that even if both are continuously
gesticulating, one person may display many more direction changes than the other in
the same time. Note also that preparatory actions and transitions such as moving up
from a homebase or a small rebound from a downward motion are placed in
parentheses. Later when “number of directions” is counted as part of the Summary
Analysis, only those not in parentheses should be counted. Also, unless it is especially
notated with parentheses, the path, spatial and dynamic qualifiers of 11, 12, and 13
accompany the main direction changes (not the transitions, preparations or "rebounds").
That is, a specific dynamic symbol is recorded directly below the direction arrow with
which it is associated. Dynamic qualities that occur at the transition between directions
are written in parentheses, e.g. (l). A quality that occurs at the very start of a direction
is written (l); one at the very end of the direction with the opposite parenthesis, e.g. (r)
CATEGORY 10: Reach Space

Only extremes in "size" are recorded in this method, so many passages will not have notation of the magnitude of the action. If a motion itself is very small, the coder should record % beside the feature that is very tiny, e.g., Dukakis' head movements or the final up-down baton actions displayed by Bush. Very large movements are defined here in terms of extensiveness of the gesticulation. Moments when the individual extends the upper limbs beyond a certain reach are noted as instances of large or extensive movement. The extension symbols are used for the following: (---) one or both arms reach above the head, elbows at least shoulder level; (---) hand(s) way out in front, elbows away from torso; (---) hand(s) below the hips; (---) arm(s) way out to the side (e.g., illustration above for Bush at 10 seconds); and various combinations of these.

CATEGORY 11: Path Type

In this category the observer is to record the type of spatial path of the phase defined by a change in direction. That is, for each direction change, is there a distinct path type: straight, arc, circular or three-dimensional/loop? There are additional symbols for the spatial character of the transition from one direction to another: simply reversing the direction back on itself (SR), angular, arc, or looped, recorded in parentheses to indicate transition. These path and transition forms are similar to those used in Choreometrics (Lomax, Bartenieff & Paulay, 1968). Note that while every effort should be made to record each change in direction, not every change in direction may have path descriptors. Observers should only record path types and spatial transitions that are distinct and unequivocal.

CATEGORY 12: Directional and Shaping

Beyond where it goes and with what path type, there is the possibility that the motion displays a distinctive mode of spatial or shaping change. This category refers to how the movement goes through space in terms of the quality of the projection. Two distinctions are made here: directional changes or movement in which projection into and through space is prominent and shaping movements in which the moving part carves three-dimensional shapes in space. A sample gesticulation segment can have moments of one or the other quality as well as direction changes that have neither directional projection or shaping quality.
In the Dukakis example, the relationship between simple direction arrows (9), path type (11), and directional projection (12) appears redundant. He tends to move up and down, in a straight path, with a distinct directional projection quality. However, it is possible to perform these up-down batons without straight paths or to make straight paths without directional projection quality, so the distinctions are kept. As one can see, the observer has to make increasingly refined judgments as he moves down the recording and in many instances may decide that a specific direction does not have clear manifestations of either directional or shaping quality—or the dynamic qualities to be described.

CATEGORY 13: Dynamic Intensity

Drawing on the concepts and terms for describing movement intensity and dynamic variation, MSA uses the terms of "effort analysis": indirect/direct, strong/light, sustained/sudden plus extreme ranges of "effort flow", extreme bound control and extreme free (Laban & Lawrence, 1947). The observer is to judge each direction change as to whether it is accompanied by one or more clear and unequivocal instances of these qualities. If there is a question or if the observer feels that it is "almost" sudden, "almost" light, etc., than a note can be made in the Individual Key that certain effort qualities are "emergent" or difficult to judge, but the observer seriously considered them. (This is the case with the George Bush example.) Only distinct instances of the qualities should included in the segment recording and counted in the Summary Analysis.

CATEGORY 14, 15: Self Touch and Instrumental Actions

While most of the action of a segment will involve facial movement, visual behavior, orientation and position changes with the gestication, it is also possible for the speaker to perform certain specific actions. In the Dukakis and Bush examples there are no instances of "nose-wipes", brow-rubs, head-scratching, hair smoothing or other forms of self-touch. Nor are there functional activities such as lights a cigarette, takes a drink of water, holds pen. (At different points in the debate all of these but the cigarette smoking could be seen, but not in the complex gestication segments used here for illustration.) We know now that such trivial actions are not trivial at all. They often serve as markers in the speech flow, punctuations, preparatory signals, commentary on the speech etc. (cf Scheflen, 1973). They are very context sensitive. Nevertheless, considered from the perspective of repeated use and patterning, these ordinary actions can figure into an individual's repertoire, particularly in terms of when and with what other changes they are performed. If the observer sees a recurrent pattern, such as a facial rub or single touch performed in a distinctive way, note may be made of how it is performed in the Individual Key. But it has to be striking, each time performed with a specific effort quality or way of holding the hand or in combination with some other action, etc. Otherwise, instances of self-touch or instrumental actions are described in ordinary action terms according to when they occur within the segment. This information may not be particularly notable for an individual Signature Analysis, but it could be important in a consideration of what actually occurs in the segment with what.

CATEGORY 16: Pathology

It is possible that the individual displays severe forms of constriction, immobility, perseveration, disorganization, exaggeration, or disordered movement within a gestication segment. If this is part of one's "movement repertoire", it is important to
include in a Movement Signature Analysis. As will be explained in Parts 2 and 3 of this
Guidebook on Movement Analysis Methods, the Signature Analysis procedure overlaps
and complements the nonverbal interaction recording (Part 3) and the Movement
Psychodiagnostic Inventory (MPI, Part 2). Category 16 is one point of intersection
because this is the place where an observer can refer to the MPI, decide if any of the
severe pathology patterns listed there describe any phase of the segment, and list them
at the point at which they occur.

Note that it is considered rare indeed for someone to display the patterns
enumerated in the MPI, if s/he has no history of severe psychiatric disorder. These are
unusual and serious forms of motor disturbance, not simply stiff postures, rigid hand
configurations, tense facial expressions, etc. Certainly Bush and Dukakis do not display
them, nor do any of the world leaders we have studied so far, except Adolf Hitler and, in
a very limited way, Saddam Hussein (Davis & Dulicai, in press; Davis, Dulicai & Hadiks,
in preparation). For most applications of MSA, it will not be necessary to learn the MPI.
However, for dance/movement therapists and other mental health professionals
interested in diagnostic aspects of movement, training in the MPI is recommended.

ADDITIONAL DESCRIPTORS

At the bottom of the General Coding Key (Figure 1) there are a number of additional
codes. Some of these distinctions may be applied to diverse categories. The recording
of a hold ( o ) can be used when the observer decides that a feature is held or
maintained to a notable degree.  means the action, activity, type of gesticulation,
position change, etc. is interrupted or not completed. If there is any ambiguity as to
when a feature ends, the / sign may be written at the point in time that it ends.
As Figure 3 indicates vertical solid lines are drawn down the recording to mark the
homebase positions and vertical hatched lines identify momentary, near-returns to
homebase. Parentheses are written around a feature when it characterizes the
transition from one action, position, or direction to another. Single parentheses are
written when the feature occurs at the very start of an action or direction or characterizes
the very end of it.

There are also symbols for when a motion is performed with a successive spread
through the limb, and when rotation of the limb is prominent. Note that these
refinements in performance are used only when the feature is notable, prominent,
stands out, repeats, is somehow stressed. Many movements may have elements of
successive spreading or rotation; these and all of the additional descriptors are applied
only when they are prominent.

Finally, a word about coordination. The MSA coding allows for simultaneous
recording of many different aspects of movement, each lined up to within 1/2 second
accuracy. Features which are directly above each other are to this degree coordinated
or co-occurring. If the observer discovers that this coordination is one of the most
distinctive aspects of the patterning, then he or she may note "co-occurrence" in a
special way. The same superscript may be written by each feature and then described
in the space below the recording together with remarks as to why it is especially noted.
PATTERN IDENTIFICATION, SUMMARY ANALYSIS

Accurate micro-recordings are to be done for each of the selected segments, although it is enough to summarize in words the particular way in which the individual displays his or her "baseline" speech actions. Once the recording is completed, preferably by at least two observers or by one with checking by another, attention shifts to precise identification and description of patterns, clusters, recurrent sequences, notable combinations of details. One effective way to do this is to zerox the finished recording and then attach an additional blank sheet below the copy. This way one can freely circle the patterns on the copy (and protect the hard-won original!), drawing arrows from the patterns to the space added below for further description.

The identification of patterns has been going on since the first viewings, so this is simply the final articulation of the signature patterns. Despite the rigor with which the observer has looked at the video thus far, it is a good idea to go back to the tape one last time, to facilitate any last minute discoveries and to check whether the recorded patterns jibe with what one sees.

Finally, the observers are at the simplest stage, tallying the number of changes per feature recorded in the segment. These tallies are entered in the Summary Analysis sheet. They may be simple totals, e.g. number of weight shifts, number of direction changes, number of strong moments, etc. If there is a need for a more rigorous observer reliability study or quantitative analysis of the patterns, then the segment can be divided into halves or thirds and the tallies for each can be entered, e.g. Facial expression A, 3 times, means the facial expression designated A in the Individual Key was seen 3 times, but occurred only in the last third of the segment. The Summary Analysis is the quantitative product of the procedure, an inventory of the person's movement arrived at from microanalysis of an actual segment. It provides additional information about the individual's repertoire, because it generates totals of features in relation to each other, i.e. relative frequencies and proportions.

The Summary Analysis may be used to study other same-length gesticulation samples of the subject in other contexts, and it may become part of a comparison study of individuals or groups. Practically speaking, this is one way to stretch the laborious MSA procedure into a relatively efficient inventory instrument useful for many possible studies.

In effect, the MSA is a systematic and replicable way to complete the discovery stage of a project, and the Summary Analysis is the quantitative instrument appropriate for more extensive research. Completing a 4-hour Movement Signature Analysis for every example of movement is absurd and undoable. On the other hand, making a relatively general movement inventory or rating instrument with which to study individuals is likely to generate trivial or vague results. While the MSA is very labor intensive and requires training and motivation to complete, it makes maximal use of the skills of the trained observer, generates some very robust and persistent patterns, and allows for many different levels of quantification and comparison with other instruments. Everything is so explicitly defined and operationalized, there is little danger of ending up with vague impressions or generalizations about the movement without reference to what is visible.

Reporting the results can be done in a number of ways. For example, the features discovered in the microanalysis and Summary Analysis can be presented in descriptive list form such as Figure 5, a Movement Signature comparison of Bush and Dukakis. However, people cannot be expected to decipher such subtle details from verbal description. Still pictures of the positions, hand configurations, body shapes and peak points of the gesture types are invaluable supplements to the report. Simplified parts of recording itself would be better than verbal description alone. But the optimal way to report the findings would be through a video of the segments edited with repeats in slow motion, still frames, and regular speed and with voice-over commentary, special effects editing and graphics to highlight what one has discovered through the microanalysis.
References

Part 1 MSA


MOVEMENT SIGNATURE ANALYSIS GENERAL CODING KEY

1. **Facial Expression**
   Changes described in affect terms; include combinations (e.g. angry-fearful) and note of degree.

2. **Gaze**
   Direction for address. Assign an initial for each person or site that is looked at by speaker.

3. **Head Movements**
   Direction arrows indicate spatial emphasis. Continuous tilting = tilt held.

4. **Trunk Orientation**
   GD = goes with gaze direction. Use effort signs for specific intensity.

5. **Weight Shift**
   Upper, whole or lower trunk sign plus directional arrows for weight shifts (e.g. = pelvis back).

6. **Positions**
   hands: X = hands folded (describe) = grasping object described
   legs: = parallel to body = crossed all legs = ankle on knee = ankle cross

7. **Gesticulation**
   Type: I = wave, toss II = indicating III = baton IV = physiograph V = ideation/elaboration
   Include combinations (e.g. II-III) and define any other (e.g. VI = emblem).

8. **Hand Configuration**
   = palm held flat plus direction it faces (in this example, down) = fist = pointing = thumbing

9. **Direction**
   Direction arrows recorded in sequence for primary directions of the gesticulation: = to subject's left = to S's right

10. **Reach**
    Space

11. **Path**
    Transition (SR) = simple reversal (SM) = same movement (SM) = looping

12. **Directional Shaping**
    V = out to side = across = upward = downward = forward = backward

13. **Dynamic Intensity**
    Plus combinations: e.g. ( ) = directed/strong = light/sustained

14. **Self-touch**
    NW = nose wipe FR = face rub/scratch BR = body rub/scratch PR = preen

15. **Instrumental Action**
    Describe specific functional activity or object manipulation, e.g. lights cigarette

16. **Pathology**
    Note specific pattern(s) from the Movement Psychodiagnostic Inventory, if any, and when occurring

**TIME**
Record counter number or seconds.

**SPEECH**
Speech transcript. Precise coordinations of speech and movement change noted with superscripts both places.

---

Holds, Stops, MARKERS

Transitions

Successive

Rotation

Degree

Co-occurrence

---

* Limb, trunk, address, hold, successive, rotation and degree signs are adapted from Labanotation (Hutchinson, 1970). Directional, shaping and dynamic (effort) symbols are adapted from the effort-shape aspects of Laban Movement Analysis (of Davis, 1979).
Figure 2  Movement Signature Analysis Individual Key
Dukakis Example

<table>
<thead>
<tr>
<th>Category</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Facial Expression</td>
<td>A=&quot;serious&quot;</td>
</tr>
<tr>
<td>2 Gaze Direction</td>
<td>←at camera ←→to right</td>
</tr>
<tr>
<td>3 Head Movements</td>
<td>↓ or ← = synchronized with same gesture direction</td>
</tr>
<tr>
<td>4 Trunk Orientation</td>
<td>Frontal, facing camera</td>
</tr>
<tr>
<td>5 Weight Shift Postural</td>
<td>---</td>
</tr>
<tr>
<td>6 Trunk Shape</td>
<td>= One unit, shoulders sloped</td>
</tr>
<tr>
<td>7 Gesticulation</td>
<td>III = baton, III-IV = baton with physiograph of &quot;pulling&quot; III-II-I = baton mixed with indicating and toss or wave</td>
</tr>
<tr>
<td>8 Hand Configuration</td>
<td>= rt thumb under forefinger, hand closed, ← = claw-like, grasp pos. = flat palm, fingers-thumb closed</td>
</tr>
<tr>
<td>9 Direction</td>
<td>↓ = down with slightest forward tendency in down ↓ = down and to side with slight forward component</td>
</tr>
<tr>
<td>10 Reach Space</td>
<td>No full reach, elbows stay close to sides through positions and gestures</td>
</tr>
<tr>
<td>11 Path Transition</td>
<td>All simple reversal</td>
</tr>
<tr>
<td>12 Directional Shaping</td>
<td>All changes in direction performed</td>
</tr>
<tr>
<td>13 Dynamic Intensity</td>
<td>Some strong ( ) and direct ( ) qualities are debatable when cramped</td>
</tr>
<tr>
<td>14 Self Touch</td>
<td>In hands-folded homebase position only</td>
</tr>
<tr>
<td>15 Instrumental Actions</td>
<td>----</td>
</tr>
<tr>
<td>16 Pathology (MPI)</td>
<td>----</td>
</tr>
<tr>
<td>No.</td>
<td>Movement Category</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Facial Expression</td>
</tr>
<tr>
<td>2</td>
<td>Gaze Direction</td>
</tr>
<tr>
<td>3</td>
<td>Head Movements</td>
</tr>
<tr>
<td>4</td>
<td>Trunk Orientation</td>
</tr>
<tr>
<td>5</td>
<td>Weight Shift</td>
</tr>
<tr>
<td>6</td>
<td>Postural Movement</td>
</tr>
<tr>
<td>7</td>
<td>Trunk Shape</td>
</tr>
<tr>
<td>8</td>
<td>Arms Position</td>
</tr>
<tr>
<td>9</td>
<td>Hands Position</td>
</tr>
<tr>
<td>10</td>
<td>Type Gesticulation</td>
</tr>
<tr>
<td>11</td>
<td>Limb Unit</td>
</tr>
<tr>
<td>12</td>
<td>Hand Configuration</td>
</tr>
<tr>
<td>13</td>
<td>Direction</td>
</tr>
<tr>
<td>14</td>
<td>Reach Space</td>
</tr>
<tr>
<td>15</td>
<td>Path</td>
</tr>
<tr>
<td>16</td>
<td>Transition</td>
</tr>
<tr>
<td>17</td>
<td>Directional Shaping</td>
</tr>
<tr>
<td>18</td>
<td>Dynamic Intensity</td>
</tr>
</tbody>
</table>

*Figure 3 Movement Signature Analysis Recording*
### SUMMARY ANALYSIS

**SUBJECT:** [Name]

**CONTEXT:** [Context]

**SEGMENT:** [Segment]

**OBSERVERS:** [Observers]

#### FACIAL

- Expression: A XYZ
- B
- C
- D

#### GAZE

- Shifts X/Y
- Targets X/Y
- Prime camera: Sec

#### HEAD

- Tilt X/Y
- With Gaze Dir X/Y
- Prime: Sec

#### TRUNK ORIENTATION

- X/Y
- Prime camera: Sec

#### WEIGHT

- Shifts X
- Prime: Sec

#### POSTURAL SHAPE

- \( \text{Shape} \)
- Trunk shape: X/Y
- Prime: Sec

#### POSITIONS

- Arm (H/B)
- X/Y Prime
- Hand: Prime
- \( \text{Type} \)
- Leg (H/B)

#### GESTICULATION

- Successive \( \text{O} \)
- Rotation \( \text{O} \)
- Bilateral \( \text{O} \)

#### HAND

- Configuration
- \( \text{Type} \)
- \( \text{Hand} \)

#### DIRECTION

- Changes X/Y
- Prime \( \rightarrow \) X
- Sec \( \rightarrow \) X

#### REACH

- Reach phrases X
- Prime
- \( \text{Sec} \)

#### PATH

- Prime
- Sec
- \( \text{TRANSITIONS} \)
- Prime
- \( \text{Sec} \)

#### DIRECTIONAL SHAPING

- \( \text{X/Y} \)
- \( \text{Prime} \)
- \( \text{Sec} \)
- \( \text{Combs} \)

#### DYNAMICS

- \( \text{X/Y} \)
- \( \text{Prime} \)
- \( \text{Sec} \)
- \( \text{Combs:} \)

#### TOUCH

- Nosepier X
- \( \text{Rub-Scratch} \)
- \( \text{Preen} \)

#### INSTRUMENTAL

- \( \text{O} \)

#### MFT

- \( \text{O} \)

#### TIME

- Segment Duration: \( \text{X} \)
- Phrase Descriptions: \( \text{X} \)

#### SPEECH

- **KEY:** # I Phase written as \( \text{a} \) = first half, \( \text{b} \) = second half or \( \text{x,y,z} \) for segment thirds

<table>
<thead>
<tr>
<th>Phase</th>
<th>Interruptions</th>
<th>Transitions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PATTERNS**

- Degree \( \text{X/Y} \)
- \( \text{Small} \)

**Action starts** | **Action endings**
--- | ---

**Additional Patterns**

- \( \text{x,y,z} \)
Figure 3: Movement Signature Comparison of Dukakis and Bush

<table>
<thead>
<tr>
<th>Category</th>
<th>Dukakis</th>
<th>Bush</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE</td>
<td>No change from &quot;neutral/serious&quot;</td>
<td>Several &quot;slight&quot; FEs: worried, near-smile, serious, stern</td>
</tr>
<tr>
<td>GD</td>
<td>All at camera but brief toward, not at, Bush</td>
<td>Several; at floor, Dukakis, panelist, audience</td>
</tr>
<tr>
<td>HM</td>
<td>Up-down with speech, rare turn with gaze direction</td>
<td>Head moves mainly in gaze direction, occasional down accent, shake &quot;no&quot;, or tilt</td>
</tr>
<tr>
<td>TO</td>
<td>Frontal throughout segment</td>
<td>Frontal throughout</td>
</tr>
<tr>
<td>WS/</td>
<td>No shifts of weight on feet</td>
<td>WSs at phrase starts, ends</td>
</tr>
<tr>
<td>P/TS</td>
<td>No postural shifts: trunk</td>
<td>Postural at start, trunk</td>
</tr>
<tr>
<td>P</td>
<td>one unit, shoulders sloped</td>
<td>Frontal, one unit</td>
</tr>
<tr>
<td>G</td>
<td>Batons throughout, rare indicator, wave or kinetograph is mixed with baton characteristics</td>
<td>Homebase varied: arms wide and symmetric, hands on lectern rim or hands together on lectern</td>
</tr>
<tr>
<td></td>
<td>Right forearm/hand as unit secondarily bilateral for arm/hand as unit, no whole arm activation with elbow away from side; no isolated hand gestures</td>
<td>Variety: tosses, batons, indicators, psychographs which have symbolic element, e.g. &quot;smoothing out&quot; motion</td>
</tr>
<tr>
<td>HC</td>
<td>Fists, hand flat with fingers close together, near-fist with thumb under forefinger (cf flicking)</td>
<td>Primarily whole arm active, left uni- or bilateral; some left forwards gestures and left hand articulation at end of whole arm actions</td>
</tr>
<tr>
<td></td>
<td>Almost all vertical up and down throughout, rare sideward, over fifty changes in direction</td>
<td>Some full extensions to side</td>
</tr>
<tr>
<td></td>
<td>Medium reach, elbows stay close to sides</td>
<td>Some full extensions to side</td>
</tr>
<tr>
<td></td>
<td>All straight path but one arc, all simple reversal transitions</td>
<td>All directional in variety of planes, no shaping</td>
</tr>
<tr>
<td></td>
<td>All directional projecting in vertical dimension, no 3-dimensional shaping</td>
<td>Effort qualities rare or emergent, only two moments of definite qualities, one direct, one strong</td>
</tr>
<tr>
<td></td>
<td>Various combinations of strong, sudden, direct often with bound to very bound flow</td>
<td>Gesture units may be interrupted midway without abruptness</td>
</tr>
<tr>
<td>Additional Patterns</td>
<td>Batons are short and build in intensity; bilateral ones become the most intense, ending very small, cramped</td>
<td>Repetition of up-down moves for emphasis is done with strain; only strong move is very small and cramped</td>
</tr>
<tr>
<td></td>
<td>May begin baton with move up that is held momentarily</td>
<td>Gestures are performed with a smooth, even quality but compared to variety of directions, emphasis and dynamics are notably sparse</td>
</tr>
<tr>
<td></td>
<td>Head moves, some very small, are downward stress synched with baton downward strokes</td>
<td>In contrast to above he may point a thumb and/or jerk his head</td>
</tr>
<tr>
<td></td>
<td>Bilateral hand gestures may be performed with right more closed than left</td>
<td>toward Dukakis with vigor and without looking at him</td>
</tr>
</tbody>
</table>

Analysis based on 32" segment of Dukakis and 30" segment of Bush
GUIDE TO MOVEMENT ANALYSIS METHODS
by Martha Davis, Ph.D.
New York State Psychiatric Institute

Part 1: MOVEMENT SIGNATURE ANALYSIS
MSA

Copyright © 1991 Martha Davis All Rights Reserved
Not for use or quotation without permission of the author. Correspondence should be
sent to Martha Davis, 1 West 85th Street, 1A, New York, New York 10024. This guide is
a supplement to the training and practice necessary for reliable coding and analysis.
The guide alone is insufficient for learning the method.
Movement Signature Analysis (MSA) is a method for identifying, recording and analyzing individual movement style. It is both a method and a specific coding system: i.e., a set of steps or procedures for discovering how an individual’s movements are uniquely patterned and a set of terms and notations designed for coding the nonverbal behavior that accompanies speaking.*

The method evolved from research by the author on individual movement patterns and dyadic interaction analysis (Davis, 1972; 1975; 1977; 1991); and is influenced by the observational methods of Elson (1941/1972) and Scheflen (1973). While it does not require prior training in Laban Movement Analysis (Laban & Lawrence, 1947; Hutchinson, 1970; Bartenieff with Lewis, 1980), some aspects of the coding are derived from the Laban movement analysis tradition, so LMA training should facilitate learning Movement Signature Analysis. The MSA method could not have been successfully completed without the contributions of Dianne Dulicai (Davis & Dulicai, in press).

Conceptually, Movement Signature Analysis is based on the assumption that individuals have unique ways of moving that pervade various contexts and are the result of many factors, from innate traits such as are reflected in the newborn “activity type” to acquired patterns associated with social role, gender, and cultural identity. However, relationships between individual movement patterns and personality, image, projection, cultural identity, or self-perception are appropriately the subject of research. All that is essential for a Movement Signature Analysis per se is that the discriminations be fine-grained and particularized enough to identify individuals, not groups. Movement patterns identified through the method are structured and patterned so precisely, that they are more appropriately called “signature patterns” than traits or tendencies. It follows from this that inventories and rating sheets are inadequate for identifying the unique ways in which the individual moves. There must be a replicable method for identifying patterns, and it is assumed here that microanalysis of selected movement phrases is the most promising way to achieve this.

Optimaly, observers completing a Movement Signature Analysis work in pairs because they can cross-check impressions with each other and divide up tedious parts of the task. Pairs can challenge each other to define what they see even more explicitly and accurately. The analysis progresses through six stages:

1. SELECTING SEGMENTS FOR MICROANALYSIS
2. DEFINING INDIVIDUAL CODES
3. RECORDING THE SEGMENT(S)
4. PATTERN IDENTIFICATION
5. SUMMARY AND COMPARISON
6. INTERPRETATION/PREDICTION

*Theoretically, it should be possible to develop MSA coding for non-speaking contexts such as dance similar in many ways to the coding to be presented. It would be a Movement Signature Analysis if it were based on the set of steps to be described and if it used similar criteria for defining beginning and ends of continuous segments, involved pattern analysis of many movement variables in relation to each other, and made discriminations fine enough to capture individual, not group, differences in movement style.
STAGE 1: Selecting Segments for Microanalysis

The procedure begins with selection of the film or videotape of the subject that is the best one can obtain. Criteria for session selection may vary, e.g., it is a recording of the context of primary interest, is a particularly important example, is the only good footage on the subject available, etc. Segments are then selected from this recording for the microanalysis. Final selection is often determined by the quality of the film or video. It must show the subject in at least a hip to head shot throughout the entire speech gesticulation. Most important, the movement must not be interrupted by cuts or changes in camera shot. One has either to supervise camera work to insure continuous, full or medium shots, or search available material for usable footage.

The time in minutes and seconds must be superimposed on the videotape to facilitate the microanalysis. Actual recordings should be accurate to half a second. For most purposes, greater accuracy is not necessary because it is the sequencing and combination of details that is important, not duration in clock time.

SEGMENT DEFINITION: The unit of study is continuous gesticulating bounded by still positions or changes in activity. The beginning of the gesticulation is defined as the start from a "rest" or "homebase" position in which the limbs are supported and the ending is marked by return back to a "homebase" position of the upper limbs. "Homebase" positions which demarcate a gesticulation segment should be held still for at least four seconds. The exception to this rule involves sequences that start and/or end with an activity other than speech gesticulating (e.g., gesticulating then lighting a cigarette). In other words, the search is for passages of speech-related activity (including position shifts, changes in focus, preparatory actions, as well as gesticulations) that can be demarcated by still positions or changes in the type of activity. Note that it is not only possible but common for a segment to contain a string of "movement phrases" demarcated by very brief returns to homebase positions. Homebase positions must be held for 4 seconds or more to mark the beginning and end of the segment. But the subject may and often does "glancingly" touch homebase and return to gesticulating, in effect defining shorter phrases string together within the segment itself.

SEGMENT TYPES: At least three types of segments need to be collected for a thorough Signature Analysis: 1) a representative of the simplest, most limited movements that accompany the subject's speech for a baseline, 2) a segment of mid-range complexity and length, and 3) an example of the longest, most complex and elaborate speech-related movement displayed:

1) Simplest—First search for an example of how the individual speaks at his or her lowest level of activity for a baseline. This should be a speaking turn in which there is no postural movement or position changes. If such turns also display no gesticulations, then this is the choice. Otherwise choose a turn in which the gesticulating is shortest (one or two changes in direction), involves the smallest upper limb unit (usually hand or forearm-hand), shows the least intensity (no distinct changes in time or force), and is spatially simplest (in and out of barely projecting into a direction before returning to homebase).

2) Mid-range—This refers to a sample of speech-related movement that is between what is simplest and most complex for that subject. Potentially, there are at least four types of mid-range segments that may be chosen for microanalysis:

2a) Mid-range/repetitive: an example of the way in which the subject is repetitive through all or most of a segment. Usually this will be two-phasic, back and forth moves, but if not, select a segment containing a string of repetitive movements what is representative of the individual's repertoire.
2b Mid-range/high intensity: maximal display of intensity (changes of force and time, whole body activation, direct or indirect approach to space) within a short or medium length segment.

2c Mid-range/preferred type: the individual may continually display a particular gesticulation type. Definitions and terms for gesture types are adapted from Efron (1941/1972). For example, a “baton” would be gesticulation that primarily relates to the stress pattern or beat of the speech.

2d Mid-range/pathology: a segment that includes signs of how, if at all, the person displays marked constriction, disorganization or other forms of motor pathology as defined in the Movement Psychodiagnostic Inventory (see this Guide, Part 3).

2e Mid-range/special pattern: if there is any other type of pattern not covered above but judged by the observer to be distinctive and important to the movement style of the subject, a special category can be defined and included.

For example, the individual may have a distinctive way of mixing self-touch actions within short or mid-range gesticulating sequences.

3) Most complex: This is a gesticulation segment that has the most complex pattern of laterality, body part units, intensity variation and spatial projection.

While theoretically, these criteria could result in many specimens, in practice, one elaborate segment may display several features, such that it alone can generate many discoveries about how the individual combines and sequences various dimensions of movement. Because microanalysis is time-consuming, the selection of specimens should be restrained by the rule: include it only if it reveals important patterns not visible in other samples.

STAGE 2. Defining Individual Codes

Figure 1 lists the sixteen categories of the Movement Signature Analysis coding developed for speaking behavior. The General Key is both a list of definitions and a reference sheet for coding. However, the definitions are only the first "approximation" for recording an individual's movement. They are the basis for STAGE 2 which involves tailoring the General categories to the specific variations of the individual. Once the specimens are selected for microanalysis, they are scanned several times to define any special variations of the features listed in the General Key. These variations are recorded in an "Individual Signature Key" (see Figure 2). Unless a special variant is noted in this section, notations in the recording are assumed to be as defined in the General Key.

A segment of gesticulating displayed by Michael Dukakis during the 1988 U.S. presidential debate will be used to illustrate the procedures (Figures 2 and 3). Note that in the Individual Key, notation is made of each target of visual regard (e.g. straight in front toward the camera or right toward, but not quite at, Bush), trunk orientation (e.g. frontal), ways of holding hands during gesticulations (e.g. right thumb under forefinger in a near-fist), etc. Combinations of types of gesticulation should also be spelled out here.

STAGE 3. Recording the Segment

To obtain a detailed recording of the actual phrasing of the movement segment, observers should examine the sample in slow motion, freeze frame, at regular speed, whatever viewing method that works for them. For example, stop-frame facilitates recording positions; slow motion aids examination of body part articulations; judgment of time and force variation requires regular speed. Some aspects will be easy to record, others may be ambiguous and difficult. While hard-to-observe aspects can make the task frustrating, they often turn out to be the most important leads to the unique ways in which the individual moves.
STAGE 4. Pattern Identification

By now the pair has seen the segment many times and has begun to identify clusters, combinations, distinctive variations. The principal function of such a detailed recording is to facilitate this pattern identification. A search for “signature patterns” does not mean finding a pattern that is exactly duplicated each time. It is a search for set combinations and sequences that are embedded within the passage, although each time one sees the pattern it may be part of a different action or be combined with different features. There are guidelines for identifying these patterns:

a) How a movement is varied is more important than what is done. For example, “looks to camera, looks at interviewer, looks at partner” is less important than identification of differences in how the subject varies the gaze, sequences the gaze direction, paces the changes, or combines a particular gaze pattern with other aspects of the nonverbal behavior. Recording of functional actions is done to facilitate identification of the manner of their performance; “what is done” becomes the hook on which to “hang” and locate the qualitative and structural patterns.

b) Attend to initiations and endings such as the precise way in which a change in direction is performed. Similarly, distinctive patterns may be detected by examining how transitions are made from one phase to another.

c) Study how the emphasis is patterned. Is there a distinctive rhythm detectable in repetitive movements? Is there a notable way in which the segment develops in terms of time and force changes?

d) Shift focus fluently from study of patterns within the various categories to between categories; e.g. look for repeated sequences of body part articulation then “pan back” to search for relationships between this and the gesticulation type, the position shifting, the gaze direction. The patterns should be circled on the recording and described in detail at the bottom of the recording sheet.

The primary purpose of such scans is to make discoveries. By definition what is being searched for are not patterns that one has already seen in others, but patterns that are unique. However systematic and explicit the procedure, there is always an element of unpredictability. A Signature Analysis should result in discovery and unanticipated results; it should facilitate new perceptions that do not contradict, but rather refine and expand initial impressions.

STAGE 5: Summary and Comparison

Once the recording of a segment is complete, the observer tallies the variations in each category onto the Summary sheet (Figure 4). Any specific combinations or sequences circled on the recording sheet are listed on the Summary sheet as well. The Summary provides information on the proportion of certain features in relation to each other (e.g. in the Dukakis segment, instances of strong, direct and sudden variations occur in a particular proportion to each other while definite examples of light, indirect and sustained dynamics are absent.) As such it provides additional information on individual movement style.

The Summary sheet generates quantitative data useful for observer reliability assessment. If observers have been working in pairs, assessment of observer agreement can be done by comparing the observations of pairs rather than individuals. The Summary sheet/inventory can also be used to examine the extent to which the patterns are found in other samples and contexts.
STAGE 6: Interpretation and Hypothesis Testing

As much as possible, the observers should work without hearing the sound and with minimal information about the individual. Any analysis of speech/motion relationships is to be done after the Signature Analysis is completed. The greater part of the MSA effort is not interpretation, but identification of patterns in movement terms using a minimal degree of inference. The discovery of motifs and structural and dynamic details that are individually distinctive is the goal. However, after defining the patterns, assessing observer reliability, and studying whether these patterns persist in other samples and contexts, there are obviously many questions which may be pursued and many problems to which the MSA might be applied. The final stage may well involve some prediction and/or interpretation of the patterns. However, while a research project may, of course, be constructed to test certain hypotheses and predictions, care must be taken not to influence or direct the MSA itself with a priori assumptions and designs. As much as possible the observers must attend to what the movement shows and not "force" information from it that is not backed up by visible evidence.

It should be clarified that the "grosser aspects" of the recording are not what are being called here "signature patterns". While it may be that types of facial expression, or where a person focuses and orients are individually consistent, these categories are regarded as very "soft signs" of individual style, highly sensitive to context and cultural variation. Recording them is a device for organizing observation of the more micro qualitative and structural patterning of movement which is the domain of a Signature Analysis.

Movement Signature Analysis is primarily a microanalytic procedure, not a fixed coding system. While the General Key contains specific categories coded in a particular way, it is not the codes that are being proposed so much as the method and the steps outlined above. Theoretically, any aspect of nonverbal behavior, including some not included in the General Key such as finer variations in tension flow, could be part of a Signature Analysis. The basic steps—1) Segment selection, 2) Individualizing the General codes, 3) Micro recording of each selected segment, 4) Search for "signature patterns", 5) Summary analysis and comparison with other examples—are what is referred to here as a Movement Signature Analysis.
As can be seen in the General Key (Figure 1), MSA coding has many symbols—some adapted from Labanotation (Hutchinson, 1970), some from effort analysis (Bartenieff with Lewis, 1980) and some pictographic or letter symbols devised for this coding. Conceivably, one could do an entire MSA with verbal descriptions alone, although it would be cumbersome and much more difficult to visualize the patterns. As long as each variation is operationally defined and the record is legible, a verbal record is viable. However, as formidable as the symbols appear at first, they are very handy and easy to learn. Ultimately they save a great deal of time and facilitate discoveries of patterns.

In this section, each category will be described in greater detail and will include observation and recording pointers. The General Key is designed to be a quick reference accompanying the recording sheets for the Individual Key, segment recording, and Summary Analysis. On the top of each recording sheet, the name of the subject, the context or source of the segment, the time interval, and observer name(s) are recorded. To illustrate the recording and analysis procedure in more detail, complex gesticulation segments of Michael Dukakis and George Bush from the first 1988 U.S. presidential debate will be used.

CATEGORY 1: Facial Expression

Reliable judgment of facial expressions in affect terms requires some training or preparation. Observers are likely to vary in the terms they ascribe to a facial expression, although their choices may show marked similarities. Consider, for example, the terms four observers used for Dukakis’ facial expression in the sample segment: “serious”, “sincere/firm”, “tense/slight smile”, “neutral”. For projects that need great accuracy in judgment of the type of expression, there are existing coding methods that one can study (e.g. Ekman, Friesen & Tompkins, 1971; Izard, 1979). For the structural and stylistic analysis that is the effort here, which facial expression is less important than when, to what degree, and with what other nonverbal behaviors. Facial expression as well as any facial movements beyond those required for speech production per se are of interest as part of the total body organization, potentially varying and coordinating with other nonverbal dimensions. And as with other aspects of nonverbal behavior, it is assumed here that the facial movement patterns are individually distinctive even as they vary with context, mood, and speech content.

In the Dukakis example mentioned above, the four observers agreed that there was no distinct, ‘fully-formed’ expression and no change throughout the segment. So while Dukakis’ tendency to lick his lips might be part of some articulation pattern such as punctuating a verbal phrase, his facial expression was low in intensity and unvarying throughout the animated gesticulation. Whether this pattern persists through other speech segments and contexts is then a question to be researched.

CATEGORIES 2, 3: Gaze Direction and Head Movements

If you have a videotape in which the subject is only seen in close-up, you need not despair—there is still the patterning of face, gaze and head movements during speech, fascinating categories considered from the perspective of individual style. Obviously gaze and head movements are tied to the context, who is being addressed, and the stress patterns and organization of the speech. But while they are important parts of the address and speech articulation “sub-systems”, they may also be studied in terms of individual patterning.

To illustrate, compare the gaze and head movement patterns of Bush and Dukakis in the First debate. Note that while both are speaking for about the same length and are very animated, the patterns are dramatically different:
Most of the time, of course, changes in gaze direction involve some movement of the head in the same direction. A great deal of gaze change not accompanied by head moves in the direction of the gaze creates the impression of being "shifty-eyed". In MSA recording, "GD" means the head movement accompanies the gaze direction. Note that the head turn may be very slight. If all changes in gaze direction are accompanied by a head turn, then one may note this in the Individual Key and avoid cluttering the record with a redundant symbol. However, this should not be forgotten in the Summary Analysis, and careful examination should be done to confirm that there are no exceptions.

Speakers may display various types of head moves besides those supporting visual behavior. It is not uncommon for the speaker to perform a series of up-down or side-to-side shakes of the head. We may be more aware when a listener head-shakes "yes" or "no", but individuals often display this during speech as well, some underlining their speech with continual head shaking. Also common are "baton-like" actions of the head in which one or more directions are stressed in such a way as to support the speech emphasis pattern. Often the direction stressed is downward, but potentially it could be any direction or series of directions. Changes in intensity, particularly time and force changes, may also be an additional dimension of the speech articulation and emphasis. Dukakis displays downward head moves without marked time or force dynamics that coincide with downward hand gestures and vocalic emphasis, a common pattern. What is distinctive is that his head moves are very small, his gaze held, and there is a slight head tilt held throughout the segment. In the selected segments, George Bush's gaze and head movement patterns are radically different from those of Dukakis.

CATEGORIES 4, 5: Trunk Orientation and Weight Shift, Postural Shift, Trunk Shape

A speaker is likely to orient his or her body toward the listener with trunk or torso vis-a-vis the listener. However, speakers can vary this greatly, for example, turning the lower body slightly away while the upper torso is "facing" the listener. Within complex gesticulations, especially in contexts in which the speaker is addressing several people, the orientation may vary and this pattern may reveal individual differences.

Weight shifts are sometimes related to trunk orientation, but this is a category with distinctive properties of its own. Note is made in the MSA when the center of weight is displaced, as in leaning forward or shifting from one foot to the other. Trunk orientation and weight shifts are recorded with the same torso symbols for distinguishing upper torso, lower torso or whole trunk when it moves as a unit. For orientation, this symbol is combined with an address sign to indicate "facing" who or what. For weight shift, it is combined with a simple direction arrow for the direction of the shift.

"Postural" movement refers to the phase in which the entire body is active and mobilized. This can occur in diverse actions, e.g. during a position shift or at some point in a gesticulation in which the body becomes totally activated (however small the movement). Note that for all the position changes and weight shifting in the Bush example, they do not necessarily include "postural" shifts.
"Trunk Shape" refers to any held configuration of the torso, whether displayed throughout the entire segment or for a phase of it. If there is no distinctive "shape" (e.g. convex, concave, narrow, wide, etc.), then nothing would be recorded. In the Dukakis/Bush examples, Bush does not display any distinctive "Trunk Shape", while Dukakis has a way of sloping his shoulders without making his upper trunk convex or stooped.

For those interested in analysis of "Body Attitude", note that this category refers to held trunk shapes, not to degree of trunk tension or marked spatial and dynamic stresses. Any indication of these has to be very pronounced to be recorded in the Individual Key and added to this row of notations. For example, if the observer notes that the subject has a way of "carrying" his or her weight, e.g. up and back, this should be described carefully in the Individual Key. But only if it is very pronounced, because such distinctions are difficult for observers to agree on unless they are marked.

CATEGORY 6: Positions

"Homebase" has been defined as the "rest" position of the body that is maintained for four seconds or longer. Usually, each segment begins with a homebase position (see the HB column on the recording) and ends in the same HB, a new one or a new functional activity. However, as the Dukakis segment of Figure 3 illustrates, many segments can be punctuated by momentary, "near-returns" to a position. These are recorded in a pictographic way and labeled (HB) with vertical hatched lines down the recording. In effect, they demarcate smaller units of the segment and often they mark changes in gesticulation type or dynamic phrasing.

A Technical Note: One dilemma of movement notation is whether to record right and left relative to the mover or to the observer. Figure 1, the General Key, presents the body part notation and direction arrows consistent with the Labanotation convention of recording body part or direction relative to the mover, i.e. right means the speaker's right not the observer's right. However, this becomes very awkward when drawing pictographs of the speaker positions that are more static. It is easier to draw them as seen (i.e. what is left to one viewing or drawing the picture is the subject's right side). In order not to distort the Labanotation symbols and conflict with the experience of those observers trained in Laban Movement Analysis, MSA coding also requires that direction and body part be recorded relative to the mover. However, I would ask the indulgence of Labanotation experts who might well wince at this, to make an exception for the pictographs of position. As long as it is clearly noted with a small R on the pictograph to indicate the subject's right, it is acceptable to draw the positions as you see them. Absence of the letter R means you are recording them from the perspective of the speaker, just as the body part and direction notation should be done throughout. Hopefully, this will work. The operative principal is, "identify" with the movement, recording body part and direction as if you were moving like the speaker when you write it down, but you can "sit back" and draw the position as you see it (if you always note R on the pictograph so that there is no confusion in reading the recording).

Note that sometimes a speaker may pause in the air with hands held up against gravity for quite long periods. This would be recorded as a pause that is part of the gesticulation, not a position.
CATEGORY 7: Gesticulation

While theoretically a Movement Signature Analysis could be done for non-speaking types of movement, it is speech gestures that are the focus here. While speech gesticulation is richly varied by context, convention and topic, it is also a notable source of information about how individuals pattern their movements. Times in which the individual is "full out" relative to his or her range of animation and gesticulation, are particularly rich sources of information about an individual’s movement style. As the MSA coding illustrates, these moments are assumed to be accompanied by all sorts of changes, not just hand gestures, making it possible to examine exactly how gaze, orientation, head movements, posture and gesticulation are interrelated and patterned.

In keeping with the notion that it is easier to record structural and dynamic variations after recording "what is done", gesticulation begins with a listing of the types of gesticulations one may display. The observer must scan the gesticulation for relatively discrete forms, many of which can be labeled with nouns or action terms found in vernacular English. For example, one of the most common gestures one may make while speaking is to simply wave or toss the hand back and forth. "I" refers to waves, tosses, "flips" of the hand or hand and arm, either in a circle or back and forth, in one alternation or in a continuous series. The next category, "II", refers to gestures in which the speaker indicates someone or something actually present with an action such as pointing at the other. "III" refers to a very common form of gesticulation, what Efron has called a Baton, in which the upper limb primarily marks the "beat" of the speech. "IV" refers to "physiographic" gesticulations (Efron, 1941/1972, p. 96) that clearly depict the form of an object, a spatial relationship, or a physical action. Efron distinguishes types of physiographic gestures, but in MSA the recording need only note "IV", the general physiographic type, and assign a verbal label of what it looks like, e.g. hits hand, indicates how large, outlines the shape of an object, etc. "V" is called in MSA ideorealization and is similar to what Efron calls ideographic or "logico-topographic", sketching the "paths of the thought-pattern" in the air (Efron, 1941/1972, p. 96).

In reality, gesticulations are not so neatly performed as these categories suggest. The observer has to be free to describe combinations or ambiguous cases that may be difficult to categorize this way. "Combinations" would be gestures simultaneously displaying two or more types, not segments with a string of different types, one after the other. Note in the examples of Dukakis and Bush below that Dukakis primarily uses "batons" (III) or combinations of III with other types, such as a gesture that has a distinct out-in-out-in beat pattern (III) combined with gaze and direction change toward Bush as if to indicate him (II) combined with a hand action resembling a toss (I). It is ambiguous and so is recorded here as a combination (III-II-I). Bush displays a variety of physiographic gestures some of which are hard to categorize for a different reason. In Bush’s segment, moves such as “smoothes” or “spreads” as if over a surface, are tentatively labeled as such because they are interrupted. Bush may change mid-gesture from one to another type of gesture, earning an additional notation for interruption (§).
Category 7 has space to record which upper limb unit(s) are involved in the gesticulation and in what sequence. Note that the traditional Labanotation symbols for limbs are used here to mean the part which is active at a given moment. Often gesticulations are performed with the whole arm raised as a unit from the homebase position. If the hand “goes into a configuration” during the arm raise, you do not need to write whole arm with separate hand activation (it will be assumed in Category 8, hand configuration, to be described). However if, during the gesticulation proper, there is variation in which part of the limb(s) is active, e.g. the hand moving, then the forearm as a unit, then the hand articulating within a forearm movement, etc. these should be recorded in sequence according to when the changes occur.

CATEGORY 8: Hand Configuration

If you watch someone gesticulate, you may see moments in which the individual holds the hand in a particular configuration, e.g. points the finger and then does a series of illustrative gestures or places open hands in front, palms facing and performs a series of illustrative actions in which the hands stay in the same configuration as the arms move in and out or up and down, etc. This category refers only to clear and definite configurations of the hand that are maintained for at least two seconds. If the person articulates the hands or the hands become mobile within the arm action, nothing is noted here. For example, loose tosses or waving actions in which the hand is vaguely moved would not be included here. While the notation may seem arcane for this, it is actually one of the easiest details to see, so if all else fails, one can draw the configuration or include pictures of the individual’s repertoire of hand configurations for clarity.

CATEGORY 9: Direction

Change in direction is the smallest “functional” unit of this recording. When recorded in the direction row (#9), it refers to changes in direction of the gesticulation. But as already noted, direction arrows can also be used for head movements and weight shifts. Note that direction is considered in its simplest sense here: where in space the movement is going relative to the mover’s upright body. (If one is recording an individual in a prone position, it would make sense to use Labanotation symbol conventions for this special case. See Hutchinson, 1970)

Once positions, types of gestures and active body part(s) are recorded, it becomes easy to record the changes in direction with the simple arrow notation. While care should be taken to accurately identify each direction, the principle function of recording direction change is to have small, easily identified units on which to locate the qualitative distinctions which will be made in categories 11, 12 and 13. The microanalysis of exactly how these changes in direction are performed becomes the more essential part of the Individual Signature Analysis.

The Dukakis and Bush examples below illustrate that even if both are continuously gesticulating, one person may display many more direction changes than the other in the same time. Note also that preparatory actions and transitions such as moving up from a homebase or a small rebound from a downward motion are placed in parentheses. Later when “number of directions” is counted as part of this Summary Analysis, only those not in parentheses should be counted. Also, unless it is especially noted with parentheses, the path, spatial and dynamic qualifications of 11, 12, and 13 accompany the main direction changes (not the transitions, preparations or “rebounds”). That is, a specific dynamic symbol is recorded directly below the direction arrow with which it is associated. Dynamic qualities that occur at the transition between directions are written in parentheses, e.g. ('). A quality that occurs at the very start of a direction is written (): one at the very end of the direction with the opposite parenthesis, e.g. (').
 CATEGORY 10: Reach Space

Only extremes in "size" are recorded in this method, so many passages will not have notation of the magnitude of the action. If a motion itself is very small, the coder should record only beside the feature that is very tiny, e.g. Dukakis' head movements or the final up-down baton actions displayed by Bush. Very large movements are defined here in terms of extensiveness of the gesticulation. Moments when the individual extends the upper limbs beyond a certain reach are noted as instances of large or extensive movement. The extension symbols are used for the following: ( ) one or both arms reach above the head, elbows at least shoulder level; ( ) hand(s) way out in front, elbows away from torso; ( ) hand(s) below the hips; ( ) arm(s) way out to the side (e.g., illustration above for Bush at 10 seconds); and various combinations of these.

 CATEGORY 11: Path Type

In this category the observer is to record the type of spatial path of the phase defined by a change in direction. That is, for each direction change, is there a distinct path type: straight, arc, circular or three-dimensional/loop? There are additional symbols for the spatial character of the transition from one direction to another: simply reversing the direction back on itself (SR), angular, arc, or looped, recorded in parentheses to indicate transition. These path and transition forms are similar to those used in Choreometrics (Lomax, Bartenieff & Paulay, 1968). Note that while every effort should be made to record each change in direction, not every change in direction may have path descriptors. Observers should only record path types and spatial transitions that are distinct and unequivocal.

 CATEGORY 12: Directional and Shaping

Beyond where it goes and with what path type, there is the possibility that the motion displays a distinctive mode of spatial or shaping change. This category refers to how the movement goes through space in terms of the quality of the projection. Two distinctions are made here: directional changes or movement in which projection into and through space is prominent and shaping movements in which the moving part sculpts itself as it carves three-dimensional shapes in space. A sample gesticulation segment can have moments of one or the other quality as well as direction changes that have neither directional projection or shaping quality.
In the Dukakis example, the relationship between simple direction arrows (9), path type (11), and directional projection (12) appears redundant. He tends to move up and down, in a straight path, with a distinct directional projection quality. However, it is possible to perform these up-down batons without straight paths or to make straight paths without directional projection quality, so the distinctions are kept. As one can see, the observer has to make increasingly refined judgments as s/he moves down the recording and in many instances may decide that a specific direction does not have clear manifestations of either directional or shaping quality—or the dynamic qualities to be described.

CATEGORY 13: Dynamic Intensity

Drawing on the concepts and terms for describing movement intensity and dynamic variation, MSA uses the terms of "effort analysis": indirect/direct, strong/light, sustained/sudden plus extreme ranges of "effort flow", extreme bound control and extreme free (Laban & Lawrence, 1947). The observer is to judge each direction change as to whether it is accompanied by one or more clear and unequivocal instances of these qualities. If there is a question or if the observer feels that it is "almost" sudden, "almost" light, etc., than a note can be made in the Individual Key that certain effort qualities are "emergent" or difficult to judge, but the observer seriously considered them. (This is the case with the George Bush example.) Only distinct instances of the qualities should included in the segment recording and counted in the Summary Analysis.

CATEGORY 14, 15: Self Touch and Instrumental Actions

While most of the action of a segment will involve facial movement, visual behavior, orientation and position changes with the gesticulation, it is also possible for the speaker to perform certain specific actions. In the Dukakis and Bush examples there are no instances of "nose-wipes", brow-rubs, head-scratching, hair smoothing or other forms of self-touch. Nor are there functional activities such as lights a cigarette, takes a drink of water, holds pen. (At different points in the debate all of these but the cigarette smoking could be seen, but not in the complex gesticulation segments used here for illustration.) We know now that such trivial actions are not trivial at all. They often serve as markers in the speech flow, punctuations, preparatory signals, commentary on the speech etc. (cf Scheflen, 1973). They are very context sensitive. Nevertheless, considered from the perspective of repeated use and patterning, these ordinary actions can figure into an individual's repertoire, particularly in terms of when and with what other changes they are performed. If the observer sees a recurrent pattern, such as a facial rub or single touch performed in a distinctive way, note may be made of how it is performed in the Individual Key. But it has to be striking, each time performed with a specific effort quality or way of holding the hand or in combination with some other action, etc. Otherwise, instances of self-touch or instrumental actions are described in ordinary action terms according to when they occur within the segment. This information may not be particularly notable for an individual Signature Analysis, but it could be important in a consideration of what actually occurs in the segment with what.

CATEGORY 16: Pathology

It is possible that the individual displays severe forms of constriction, immobility, perseveration, disorganization, exaggeration, or disordered movement within a gesticulation segment. If this is part of one's "movement repertoire", it is important to
Include in a Movement Signature Analysis. As will be explained in Parts 2 and 3 of this Guidebook on Movement Analysis Methods, the Signature Analysis procedure overlaps and complements the nonverbal interaction recording (Part 3) and the Movement Psychodiagnostic Inventory (MPI, Part 2). Category 16 is one point of intersection because this is the place where an observer can refer to the MPI, decide if any of the severe pathology patterns listed there describe any phase of the segment, and list them at the point at which they occur.

Note that it is considered rare indeed for someone to display the patterns enumerated in the MPI, if he has no history of severe psychiatric disorder. These are unusual and serious forms of motor disturbance, not simply stiff postures, rigid hand configurations, tense facial expressions, etc. Certainly Bush and Dukakis do not display them, nor do any of the world leaders we have studied so far, except Adolf Hitler and, in a very limited way, Saddam Hussein (Davis & Dulicai, in press; Davis, Dulicai & Hadiks, in preparation). For most applications of MSA, it will not be necessary to learn the MPI. However, for dance/movement therapists and other mental health professionals interested in diagnostic aspects of movement, training in the MPI is recommended.

ADDITIONAL DESCRIPTORS

At the bottom of the General Coding Key (Figure 1) there are a number of additional codes. Some of these distinctions may be applied to diverse categories. The recording of a hold (o) can be used when the observer decides that a feature is held or maintained to a notable degree. \{ \} means the action, activity, type of gesticulation, position change, etc. is interrupted or not completed. If there is any ambiguity as to when a feature ends, the / sign may be written at the point in time that it ends. As Figure 3 indicates vertical solid lines are drawn down the recording to mark the homebase positions and vertical hatched lines identify momentary, near-returns to homebase. Parentheses are written around a feature when it characterizes the transition from one action, position, or direction to another. Single parentheses are written when the feature occurs at the very start of an action or direction or characterizes the very end of it.

There are also symbols for when a motion is performed with a successive spread through the limb, and when rotation of the limb is prominent. Note that these refinements in performance are used only when the feature is notable, prominent, stands out, repeats, is somehow stressed. Many movements may have elements of successive spreading or rotation; these and all of the additional descriptors are applied only when they are prominent.

Finally, a word about coordination. The MSA coding allows for simultaneous recording of many different aspects of movement, each lined up to within 1/2 second accuracy. Features which are directly above each other are to this degree co-ordinated or co-occurring. If the observer discovers that this coordination is one of the most distinctive aspects of the patterning, he or she may note "co-occurrence" in a special way. The same superscript may be written by each feature and then described in the space below the recording together with remarks as to why it is especially noted.
PATTERN IDENTIFICATION. SUMMARY ANALYSIS

Accurate micro-recordings are to be done for each of the selected segments, although it is enough to summarize in words the particular way in which the individual displays his or her "baseline" speech actions. Once the recording is completed, preferably by at least two observers or by one with checking by another, attention shifts to precise identification and description of patterns, clusters, recurrent sequences, notable combinations of details. One effective way to do this is to zerox the finished recording and then attach an additional blank sheet below the copy. This way one can freely circle the patterns on the copy (and protect the hard-won original), drawing arrows from the patterns to the space added below for further description.

The identification of patterns has been going on since the first viewings, so this is simply the final articulation of the signature patterns. Despite the rigor with which the observer has looked at the video thus far, it is a good idea to go back to the tape one last time, to facilitate any last minute discoveries and to check whether the recorded patterns jibe with what one sees.

Finally, the observers are at the simplest stage, tallying the number of changes per feature recorded in the segment. These tallies are entered in the Summary Analysis sheet. They may be simple totals, e.g. number of weight shifts, number of direction changes, number of strong moments, etc. If there is a need for a more rigorous observer reliability study or quantitative analysis of the patterns, then the segment can be divided into halves or thirds and the tallies for each can be entered, e.g. Facial expression A 3 / 2 means the facial expression designated A in the Individual Key was seen 3 times, but occurred only in the last third of the segment. The Summary Analysis is the quantitative product of the procedure, an inventory of the person's movement arrived at from microanalysis of an actual segment. It provides additional information about the individual's repertoire, because it generates totals of features in relation to each other, i.e. relative frequencies and proportions.

The Summary Analysis may be used to study other same-length gesticulation samples of the subject in other contexts, and it may become part of a comparison study of individuals or groups. Practically speaking, this is one way to stretch the laborious MSA procedure into a relatively efficient inventory instrument useful for many possible studies.

In effect, the MSA is a systematic and replicable way to complete the discovery stage of a project, and the Summary Analysis is the quantitative instrument appropriate for more extensive research. Completing a 4-hour Movement Signature Analysis for every example of movement is absurd and unfeasible. On the other hand, making a relatively general movement inventory or rating instrument with which to study individuals is likely to generate trivial or vague results. While the MSA is very labor intensive and requires training and motivation to complete, it makes maximal use of the skills of the trained observer, generates very robust and persistent patterns, and allows for many different levels of quantification and comparison with other instruments. Everything is so explicitly defined and operationalized, there is little danger of ending up with vague impressions or generalizations about the movement without reference to what is visible.

Reporting the results can be done in a number of ways. For example, the features discovered in the microanalysis and Summary Analysis can be presented in descriptive list form such as Figure 5, a Movement Signature comparison of Bush and Dukakis. However, people cannot be expected to decipher such subtle details from verbal description. Still pictures of the positions, hand configurations, body shapes and peek points of the gesture types are invaluable supplements to the report. Simplified parts of recording itself would be better than verbal description alone. But the optimal way to report the findings would be through a video of the segments edited with repeats in slow motion, still frames, and regular speed and with voice-over commentary, special effects editing and graphics to highlight what one has discovered through the microanalysis.
References

Part 1 MSA


# MOVEMENT SIGNATURE ANALYSIS GENERAL CODING KEY

1. **Facial Expression**
   - Changes described in affect terms; include combinations (e.g. angry-heapful) and note of degree.

2. **Gaze Direction**
   - For address. Assign an initial for each person or site that is looked at by speaker.

3. **Head Movements**
   - Direction arrows indicate spatial emphasis. \( \rightarrow \) = tilt held

4. **Trunk Orientation**
   - Continuous tilting \( \cdots \) = tilt held

5. **Weight Shift**
   - Upper, whole or lower trunk sign plus directional arrows for weight shifts. (e.g. \( \uparrow \uparrow \) = pelvis back)

6. **Positions**
   - Arms: \( \cdots \) = whole arm
   - Hands: \( \cdots \) = hands folded
   - Legs: \( \cdots \) = parallel

7. **Gesticulation**
   - Type: \( \rightarrow \) = whole arm
   - Configuration: \( \cdots \) = whole arm
   - Hand: \( \cdots \) = palm held flat

8. **Direction**
   - \( \rightarrow \) = to subject’s right

9. **Reach Space**
   - \( \cdots \) = arm far to side

10. **Dynamic Intensity**
    - \( \cdots \) = widening
    - \( \cdots \) = rising

11. **Settlesh**
    - \( \cdots \) = nose wipe

12. **Instrumental Action**
    - \( \cdots \) = lights cigarette

13. **Pathology**
    - \( \cdots \) = note specific pattern(s) from the Movement Psychodiagnostic Inventory, if any, and when occurring

**TIME**
- Record counter number or seconds.

**SPEECH**
- Speech transcript. Precise coordinations of speech and movement change noted with superscripts both places.

**HOLDS, STOPS, MARKERS**
- \( \cdots \) = feature held, maintained \( \cdots \) = action interrupted, not completed \( \cdots \) = feature ends

**TRANSITIONS**
- \( \cdots \) = feature occurs at start of action or direction

**SUCCESSIVE**
- \( \cdots \) = successive move of arm

**ROTATION**
- \( \cdots \) = right limb rotates inward \( \cdots \) = left limb outward

**DEGREE**
- \( \cdots \) = very slightly

- Limb, trunk, address, hold, successive, rotation and degree signs are adapted from Labanotation (published, 1970).
- Directional, shaping and dynamic (effort) symbols are adapted from Labanotation Analysis (Davis, 1979).
- Figures 1-15 adapted from Labanotation Analysis (Davis, 1979).
**Figure 2 Movement Signature Analysis Individual Key**

Dukakis Example

<table>
<thead>
<tr>
<th>Category</th>
<th>Key</th>
<th>Homebase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Facial Expression</td>
<td>A=&quot;serious&quot;</td>
<td>A</td>
</tr>
<tr>
<td>2 Gaze</td>
<td>(\rightarrow) at camera (\rightarrow) to right</td>
<td>(\rightarrow)</td>
</tr>
<tr>
<td>3 Head Movements</td>
<td>(\downarrow) or (\leftarrow) = synchronized with same gesture direction</td>
<td>(\leftarrow)</td>
</tr>
<tr>
<td>4 Trunk Orientation</td>
<td>Frontal, facing camera</td>
<td></td>
</tr>
<tr>
<td>5 Weight Shift</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>6 Postural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Trunk Shape</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 arms</td>
<td>(\Uparrow) = One unit, shoulders sloped</td>
<td>(\Uparrow)</td>
</tr>
<tr>
<td>Position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 limbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Gesticulation</td>
<td>III = baton, III-IV = baton with physiograph of &quot;pulling&quot; III-II-I (\rightarrow) baton mixed with indicating and toss or wave</td>
<td>(\rightarrow)</td>
</tr>
<tr>
<td>11 limb unit</td>
<td>(\Uparrow) = rt forearm/hand as unit</td>
<td>(\Uparrow)</td>
</tr>
<tr>
<td>12 Hand Configuration</td>
<td>(\Uparrow) = fist that develops from &quot;grasp&quot; (\Uparrow) = bilateral forearm/hand as unit</td>
<td>(\Uparrow)</td>
</tr>
<tr>
<td>13 configuration</td>
<td>(\Uparrow) = flat palm, fingers-thumb closed (\Uparrow) = claw-like, grasp pos.</td>
<td>(\Uparrow)</td>
</tr>
<tr>
<td>14 Direction</td>
<td>(\downarrow) = down with slightest forward tendency in down (\downarrow) = down and to sides with slight forward component</td>
<td>(\downarrow)</td>
</tr>
<tr>
<td>15 Reach Space</td>
<td>No full reach, elbows stay close to sides through positions and gestures straight ((-)) and arc ((\sim)) paths are very clear</td>
<td>(\sim)</td>
</tr>
<tr>
<td>16 Path Transition</td>
<td>All simple reversal</td>
<td></td>
</tr>
<tr>
<td>17 Directional Shaping</td>
<td>All changes in direction performed with marked directional projection</td>
<td></td>
</tr>
<tr>
<td>18 Dynamic Intensity</td>
<td>Some strong ((\leftarrow)) and direct ((\rightarrow)) qualities are debatable when cramped</td>
<td></td>
</tr>
<tr>
<td>19 Self Touch</td>
<td>In hands-folded homebase position only</td>
<td>(\times)</td>
</tr>
<tr>
<td>20 Instrumental Actions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 Pathology (MPI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Facial Expression</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Gaze Direction</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Head Movements</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Trunk Orientation</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Weight Shift</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Postural Movements</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Trunk Shape</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Arms Position</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Hands Position</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Legs Position</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Type Gesticulation</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Gesticulation</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Limb Unit</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Hand Configuration</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Direction</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Reach Space</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Path Transition</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Dynamic Shaping</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Intensity</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3 Movement Signatures Analysis Recording
Sukas Exam Continued
SUMMARY ANALYSIS—SUBJECT: D.W.K.; CONTEXT: IT; SEGMENT: Y"; OBSERVERS: MB + DD

FACIAL:
Expression A
Gaze
Shifts: Z
Targets: Y
Prime
Sec

HEAD:
Tilt: A
With Gaze: D
Prime
Sec

TRUNK ORIENTATION:
Prime
Sec

WEIGHT:
Shifts: C
Prime
Sec

POSTURAL TR. SHAPE:
Post :: D
Prime
Sec

POSITIONS:
Arm (HB) D
Prime
Sec
Hand: Prime
Leg (HB) D
Prime
Sec

GESTICULATION:
Type: I
II
III
IV
Prime
Sec
Unit: D
J
I
Bilateral

HAND:
Configuration: E
Prime
Sec

DIRECTION:
Changes: F
Prime
Sec

REACH:
Reach phrases: C
Prime
Sec

PATH:
Prime
Sec
TRANSITIONS:
Prime
Sec

DIRECTIONAL SHAPING:
Prime
Sec

DYNAMICS:
Prime
Sec

TOUCH:
Nose wipe O
Rub-Scratch O
Preen O

INSTRUMENTAL:

MPT:

TME:
Segment Duration: 3y" Phrase Demarcations: 2 3 5 7 9 12 14 22 23

SPEECH

KEY: # | Phrase written as a = first half, b = second half or x,y,z for segment thirds

Holds, Pauses: I
Interruptions: O

Pattern: C
Degree: 5

Ears
Action starts
Action endings

Additional Patterns
Figure 5: Movement Signature Comparison of Dukakis and Bush

Category

Dukakis

1. FE No change from neutral/serious
2. GD All at camera but brief toward, not at, Bush
3. HM Up-down with speech, rare turn with gaze direction
4. TO Holds head in slight tilt
5. W/T No shifts of weight on feet
6. P No postural shifts: trunk one unit, shoulders sloped
7. G Same throughout, rare indicator, wave or kinetograph
8. HT Homebase: arms symmetric, left hand over right on lectern
9. MT All at right, left forearm/hand as unit
10. RS No postural shifts: trunk one unit, shoulders sloped
11. RT All straight path but one arc, all simple reversal
12. DS All directional projecting, no 3-dimensional shaping
13. DI Various combinations of strong, sudden, direct often with bound to very bound flow

Additional Patterns

Bilateral arm and leg movement

Analysis based on 32" segment of Dukakis and 30" segment of Bush

Bush

Several "slight" FEs: worried, near-smile, serious, stern
Several at floor, Dukakis, gunnail, audience
Head moves mainly serve gaze direction, occasional down accent, shake "no", or short
Frontal throughout
WAS at glevesse space, ends
Postural at start, trunk frontal, any unit
Homebase varied: arms wide and asymmetric, hands on lectern rim or hands together on lectern
Variety: tossing, baton, indicators, physiographs which have symbolic element e.g. "smoothing out" motion
Primarily whole arm active, left uni- or bilateral, some left forearm gestures and left hand articulation at end of whole arm actions
Series of directional: sideways, forward, backward, up and down, down-side diagonals: about 25 changes in direction
Some full extensions to sides
Straight and across paths, angular or simple reversal transitions
All directional in variety of planes, no shaping
Effort qualities rare or emergent, only two minutes of definite qualities, one direct, one strong
Gesture units may be interrupted midway without discontinuity

Analysis based on 32" segment of Dukakis and 30" segment of Bush
GUIDE TO MOVEMENT ANALYSIS METHODS

by Martha Davis, Ph.D.
New York State Psychiatric Institute

Part 2: MOVEMENT PSYCHODIAGNOSTIC INVENTORY
MPI
Attention to patterns of body movement has been part of psychodiagnosis for over a century from the early treatises on dementia praecox to the present DSM III-R. However, psychiatric nosologies tend to cite motor symptoms that are bizarre and extreme with a terminology that is general and imprecise (e.g. "stereotypies", "blunted affect"). The Movement Psychodiagnostic Inventory* (MPI) is an instrument for assessing severe psychopathology from body movement. It is based on the assumption that the diagnostic potential of body movement is best realized with a refined and subtle analysis using terms that describe the movement patterns very precisely and specifically.

The MPI is based on years of clinical and research experience assessing psychiatric patients (Davis, 1970, 1974, 1975, 1977, 1985). It has been developed for research into the nonverbal dimensions of psychodiagnosis, the effects of medication on body movement, and the analysis of movement states in psychotherapy process. Studies in which individuals unknown to observers were observed without sound indicate that the method may predict differential diagnosis and rather specific presenting problems as well as overall level of pathology and functioning.

While earlier versions of the MPI have been used in research and by clinicians for many years, validity studies are still in progress. Until research rigorously substantiates the method, each item of the coding instrument should be regarded as a hypothesis. That is, each item designated as "pathognomonic" in the MPI has been observed in psychiatric patients and is posited to correlate with severe psychopathology. But the instrument must be used with caution given the preliminary stage of validation and the sensitive ethical and clinical implications of diagnosis based to any degree on body movement. Because of these considerations and because of the nature of the movement patterns themselves, the MPI is to be coded very conservatively. These features are rather rare and they are not simply forms of "awkwardness", "rigidity", "tightness", etc. The rule is: if in doubt, do not record that the pattern was observed. The MPI may be applied to diverse contexts, although it is primarily designed for assessment of individuals during conversational contexts such as a psychiatric consultation. If it is applied to contexts such as dance/movement therapy sessions, it would have to be adapted according to "subsystem" categories more appropriate for that. Or the dance/movement therapist could judge presence of features regardless of what the patient is doing. It is also a method that relies on film or videotape to allow for repeat viewing. There are ways to use the MPI for one time, live observation, but these are limited and specialized. This guide assumes analysis of videotapes in which for 20 minutes or more the camera is focused on the subject in at least a medium shot (hips to head).

*Earlier versions of the Movement Psychodiagnostic Inventory were called Movement Diagnostic Scale, Communicative Behavior Assessment and Movement Behavior Assessment. Sections of this guide are adapted from a lecture prepared for the Movement Therapy Program at the Laban Centre, Goldsmiths College, University of London, 1988.
Completing a Movement Psychodiagnostic Inventory involves five stages:

1. SELECTION AND EVALUATION OF THE VIDEO RECORDING
2. ACTION INVENTORY OF THE SUBSYSTEMS
3. PRIMARY MPI CODING
4. MPI PROFILE ANALYSIS
5. INTERPRETATION

STAGE 1: SELECTION AND EVALUATION OF THE VIDEO RECORDING

A sample MPI is presented at the end of this text. The first page of the MPI includes space for identifying information and for analysis of the videotape camera work. If you can direct the camera work, make sure that the camera is placed so that the subject can be seen as frontally as possible in full body shots for the entire event. In an interview, it is best to train the camera on the subject and let it run for the entire session so no cameraperson need be present. The ideal recording for such an analysis is created by two cameras: one on the patient, the other fully on the interviewer, such that the bodies of both, including their facial movements and gaze patterns, can be seen continuously in a split screen. One camera may be used for a side shot of both, but be careful not to lose details of the face and gaze of the subject.

Many situations do not allow for control of the camerawork, the most obvious being one in which you already have the subjects’ permission to use a videotape appropriate and valuable for your study purposes. In most such videotapes, there are shifts from close-ups to two-shots to medium shots with many, seemingly arbitrary, cuts in the continuity of the action. While these are not optimal for movement analysis, they are still usable if the limitations on the video are spelled out. Page 1 of the MPI provides space for recording the camera shot distribution as information on what the MPI is based:

<table>
<thead>
<tr>
<th>MOVEMENT PSYCHODIAGNOSTIC INVENTORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject: __________________________</td>
</tr>
<tr>
<td>Observer: __________</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>CAMERA SHOT DISTRIBUTION</td>
</tr>
<tr>
<td>Close-up</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Totals:</td>
</tr>
</tbody>
</table>
If possible, make a copy of the videotape with the time in seconds and minutes superimposed on the top of the screen (i.e. avoid covering the subjects' movements with the numbers). If you cannot do this, then you will have to use the VCR counter numbers or estimate the total time per session in each type of camera shot. Five distinctions are made here: head close-up, from upper arm or chest up, from thigh/hip to head (medium shot), head to foot of subject, and hip shots or more of both speakers.

There is space on Page 1 to indicate whether the subject could be seen walking and/or sitting down or getting up from the chair, valuable for judging certain items on the MPI. Page 1 also includes space for recording the exact times of segments selected for a Movement Signature Analysis (see Part 1 of this guidebook, Movement Analysis Methods). The Movement Signature Analysis complements the Movement Psychodiagnostic Inventory—the former providing a comprehensive analysis of the movement style and the latter focusing on disturbed patterns. Assessment of psychodiagnosis from movement should involve attention to the overall repertoire, especially indications of assets and strengths, as well as problems. When possible and appropriate, both should be done. (There is space within the Movement Signature Analysis recording for signs of disorder as defined in the MPI, though in many applications of the MSA, subjects will not display any MPI patterns.)

The bottom of Page 1 includes space for additional comments regarding the recording situation, session selection, limits on viewing, special observations not covered in the inventory, etc. It also has a coding Key. Items on the MPI are judged as "never seen", "rare", and "some or frequent" unless noted otherwise. Particularly important is the option "A" which means the pattern was almost coded. If an observer struggles with a particular item, debating seriously as to whether it is clearly displayed, and decides that he or she cannot confidently note it, an "A" should be written instead. The rule is to be very conservative. If there is serious doubt, do not record. However, the fact that the observer seriously considered an item is important. It may provide information valuable in assessing observer agreement; and it may be useful in a study of emerging signs or changes over time. Items marked "A" are not counted in the final profile, however. The final profile must be based on observations that the coder makes with confidence—clear and unequivocal instances of the pattern.

STAGE 2 ACTION INVENTORY OF SUBSYSTEMS

It is useful to consider the visible behavior of someone speaking to another as a composite of several "subsystems" of activity, much of it conventional behaviors associated with maintaining conversation. Page 2 of the MPI is an inventory of the relative frequency of behaviors within these various subsystems (see page 2 of MPI at end of this text).

The Gesticulation subsystem (G) includes hand/arm gesticulations that accompany speech as well as gestures that may substitute for speaking, such as a shrug or the "OK" sign of the hand. While someone is talking and listening, they may display repetitive actions, such as rocking or foot-tapping, or various forms of self-touch, such as repetitive scratching of an arm or single "nose-wipes". Repetitive actions of head or trunk and forms of self-touch, including preening actions or fixing one's clothes and hair are grouped here under the "Self-related" subsystem (S). The Instrumental (I) subsystem refers to functional activity occurring during the conversation, e.g. smoking a cigarette, drinking a cup of coffee, moving a chair into place. The Orienting (O) subsystem involves behaviors necessary for focusing on the other, watching the other as he or she speaks, turning toward the other.

Some head movements, such as head turns with gaze, serve the Orienting subsystem, but others, defined here as part of a Head Moves subsystem (H), appear related to speech emphasis and are accompaniments to listening, such as shaking the head in affirmation. Page 2 also provides space for noting the general degree and
extent of distinct facial expressions, part of the facial expression subsystem (F). Finally there is space for recording the number of different resting positions displayed (not the total number assumed over the session, but how many different types can be seen) as part of a Position and Postural subsystem (P).

Obviously, gesticulation, orienting behaviors, head movements, facial expression, positions, instrumental actions and self-related movements are interrelated. However, there are several reasons for distinguishing them in the MPI coding procedure. The inventory of their relative frequency allows for comparison with other studies, such as those of Freedman et al (Freedman and Grand, 1987) on object-focused vs self-focused movements that are comparable to the gesticulation subsystem and the repetitive self-touching items described here. Page 2 is in effect an inventory of "what is done", it helps to frame the analysis in terms of the type of activity as it is commonly perceived. If the coder goes immediately into a search for structural or qualitative patterns irrespective of what is being done, they will not be grounded in the most easily identified units of behavior. And it is easier to visualize and understand a report of the observations, if they are related to these common types of actions. Finally, there is reason to assume that some individuals display motor pathology in only certain subsystems, and this has diagnostic implications.

If one had only the observations of Page 2, there might already be signs of trouble. No gesticulations or head movements accompanying a half an hour of talking is noteworthy. Less than 2 gesticulations per 10 minutes and scores of 1 and 2 on any of the orienting, head moves, and facial expression items of the Action Inventory of Page 2 are regarded here as signs of impoverishment or restriction in one's communicative repertoire. These items will be used for determining the score on the "Limited Communicative Repertoire" item of the final profile analysis.

High frequency of repetitive actions, self-touch or Instrumental activity are considered noteworthy, but highly ambiguous. Avoiding gaze, not orienting ones body toward the other, making no facial expressions are said "soft signs" of disturbance. While they may accompany more serious motor signs of psychopathology, they are in themselves too ambiguous and context sensitive to be the sole basis for diagnostic prediction. They should be recorded for research and comparison purposes; they are valuable as context and frame for the patterns to be discussed; and they are potentially soft signs of trouble that should be inventoried. But they are not regarded here as pathognomonic of specific mental disorders to the degree that the structural and qualitative descriptors of the MPI are regarded.

STAGE 3 PRIMARY MPI CODING

Pages 3 to 5 of the MPI coding sheets are its core. They are a list of 50 specific patterns grouped into ten categories or factors developed from the author's research and clinical experience. The observer is to consider whether a given pattern is displayed by the subject and, if so, to what degree (1 for rare but clearly present and 2 for some or relatively frequently). 1 or 2 is entered in the space for each subsystem of behavior in which the pattern is observed. For example, if a very few incidents of "sporadic, sudden moves as if out of nowhere" were seen in the gesticulating and self-touching behavior, the coder would score: G _S  F  H  F  P  in item 1.2.

The following are brief descriptions of the ten primary categories of patterns listed in pages 3-5 of the MPI:

I DISORGANIZATION

Does the observer notice any phases in which the movement is notably disorganized, fragmented, severely out-of-synch. This category, like those that follow, refers to qualities and patterns of movement, how the person is moving not what he or
she is doing. These are distinctions regarding the manner of performance and the qualitative and structural patterning of the movement itself. This category refers to patterns that are more than simply "awkward" or "ungraceful". Simultaneous or sequential actions occurring in different body parts may be notably at odds with each other; body movements may be severely isolated from actions of the rest of the body; even the hands and fingers may be hyperextended and flexed at the knuckles in such a way that the fingers are disconnected from the hand and grasping is not integrated. The fluency and "coherence" of the movement may be broken up with sudden changes in direction coming "out of the blue". As the sample of the MPI presented at the end of this text indicates, there are at least 12 forms of "Disorganization" perceptible in real time. (Some of these patterns must be related to the forms of "self-dyssynchrony" that Condon (1968) has identified through film microanalysis as fine as 1/24 of a second. In the MPI a variety of disorganized patterns are identified in real time, not slow motion. Slow or stop motion may actually obscure them.)

II IMMOBILITY

The items of Category II are extreme forms of constriction and immobility. Normal conversational behavior involves some head and facial movement, at least occasional position shifts, gesticulations and some degree of shifting in which the trunk is engaged. Low mobility refers here to extremes of holding or inactivity of various body areas. Note that a person could be very active in the sense of constantly fidgeting or even pacing and be low in mobility as defined here. That is, he or she may still be highly constricted in the body during the activity.

III LOW INTENSITY

Normal movement shows instances of dynamic "color" such as a strong emphasis, a quick gesture, a slow turn of the head, or a very direct action, etc. This factor refers to the virtual absence of movement dynamics or "effort" qualities (sudden, sustained, light, strong, direct, indirect) and the display of very neutral and unchanging tension patterns (cf Bartenieff with Lewis, 1980 for a vivid description of "effort" terms for describing movement dynamics.)

IV LOW SPATIAL COMPLEXITY

Ordinary movements display some projection into space and directionality and have some degree of spatial sequence complexity. In contrast, the patterns of Category IV refer to movements lacking spatial complexity and projection, such as vague in and out changes or moves that display a fleeting projection into a direction then become reduced to spatially vague moves or fall back to a rest position.

V PERSEVERATION/FIXED-INVARIANT

Movements are often repetitive. People may tap a foot for a long time or perform gesticulations up and down in long series. This factor refers to a special case of repetition—exact repetition in which there is precise duplication of the movement size, intensity, spatial path and body part articulation. Highly repetitive motions are rarely performed with each phase exactly like the next in terms of emphasis, tension, size, direction, path, etc. Analogous to perseveration in speech, this category includes forms of exact repetition in motor performance, as well as cases in which the entire movement phrase is strictly limited to one spatial axis or plane.
VI. FLACCIDITY OR RETARDATION

Is there a marked limpness or giving into gravity within the trunk, at the end of gestures, or in the resting limbs? Flaccidity in this sense is very extreme, not simply looseness or floppy movements. It involves losing "tonus" and any degree of active tension or carrying of one's weight—that which gives normal movement its elasticity and aliveness. Related but different are the items of this category dealing with motor retardation. The operational definition of motor retardation in this coding refers to movement phrases displaying continuous slowness in the effort dynamic sense or to movements performed with a level of tension and lack of acceleration in every moment such that the action has a very long duration.

VII. DIFFUSION

This category refers to movements that are very vague, formless, and without clear definition, such as distinct beginnings and endings. This may be profound spatial diffusion in which you cannot discern distinct directions or paths, or dynamic diffusion in which the intensity runs on and on without crescendos, decresendos or coherent sequences of emphasis and development. It also includes diffuse overlapping in which the person starts a new activity before ending the previous one. Diffusion is to be distinguished from simple lack of spatial projection and complexity as described in Category IV. In category IV lack of spatial directionality and distinct shaping or sculpting of moves in space is recorded if this characterizes all of the movement of the session. And limited spatial projection may be performed with definite phrasing, clear beginnings and endings, etc. In Category VII the coding of diffusion may be done for a single phrase and the diffusion describes not only lack of distinct directionality and boundaries, but spatial or dynamic vagueness may be visible even in movements that traverse a fairly intricate series of points in space.

VIII. EXAGGERATION

Are the gesticulations very large, full limb extensions throughout the phrase. If there are points at which the movement varies in size or changes to a smaller body part, it would not earn a coding in this category. Also included in this category are actions that appear exaggerated, too large, intense and dramatic for what they are, such that they appear bizarre. Again this has to be very extreme to be recorded.

IX. HYPERKINESIS

This category refers to movements that are performed very rapidly, one after another virtually without pause or deceleration in any phase of the action. It also includes the pattern in which a person makes a very high number of position shifts during periods in which she or he is not talking/gesticulating or engaged in instrumental, functional activities that require them.

X. EVEN CONTROUS SUSPENSION

In motion or stillness the body weight may be controlled, the person not giving into gravity or becoming momentarily free in tonus or flow. This may be seen in mild forms as high degrees of evenly maintained tension or flow through the entire phrase. High, evenly maintained bound flow throughout a phrase can also be performed with minimal vigor, force and sense of weight. At its most extreme, the movement may have a very even, weightless, surreal quality.
Note that on MPI pages 3-5 each item has a particular range of subsystem coding spaces. This is because some patterns cannot be seen in certain subsystems or the presence of a pattern may be pathological in one subsystem but not in another. The MPI is designed to identify disturbed patterns, not to record every possibility of a given pattern. Coding 0 on all items of the Action Inventory and no entries on pages 3-5 of the MPI is regarded as support for a prediction of no severe psychopathology.

Certain items, by definition, may involve several subsystems. For example, "body fragmentation" is defined as "movement occurring sporadically in different body parts during a phrase without a coherent sequence or fluent connections." This means that the continuous action in which the fragmentation is displayed may involve gesticulation, head movements, self-touch, and position shifts. When this occurs, it is important not to code the same movement two or more times within one item. For example, if there are only two phrases of movement in the entire session displaying "body fragmentation" and both of these phrases involve four subsystems, then a 1 is placed in the subsystem that is the furthest left on the coding sheet, e.g. gesticulation, and arcs are drawn from it to the other three subsystems involved. In this way it will be clear that the code refers to rare movements that combine subsystems without inflating the prevalence of the pattern by entering 1 in four different places. (However, if the same pattern is displayed in two subsystems at different times, its presence in each subsystem is coded.)

UNIT OF OBSERVATION

In the MPI, the unit of movement varies for different patterns. In some cases it involves judgement of the movement "phrase", i.e. the continuous action occurring between two rest positions. In some cases it is relative to the entire session observed. In other cases the pattern would be coded as present if it were seen just once, no matter how long the specific movement lasts or how it is defined. In still other cases, the feature is defined relative to a fixed time interval.

Note when the item says "per phrase" the pattern must be characteristic of the entire movement from start to stop, a phrase being defined here as the movement occurring between at least briefly assumed "homebase" positions. That is, if the person is in a specific position, moves (gesticulates, touches oneself, lights a cigarette, etc.) and returns to the position or assumes another position that is held for four seconds or longer, this would be considered a "phrase". (The exception to the four-second rule is the case in which the position is very briefly assumed two or more times. In this case "homebase" is defined by the repetition and the movement phrases are defined as each of the movement sequences between each momentary position.)

The coder has to read each item carefully and learn which unit of behavior it is based on. If there is no explicit mention of the unit or time interval, it is assumed to be a characteristic that is coded if it is seen even fleetingly within a movement.

PATHOGENOMIC PATTERNS

Note that in each of the MPI categories, certain items are asterisked. This means that each of these patterns are hypothesized to be serious signs of major psychiatric disorder. Depending on the pattern, it may be associated with Schizophrenia, Delusional (Paranoid) Disorder, Major Depression, Bipolar Disorder, or non-organic Psychotic Disorders "not elsewhere classified" in the DSM III-R. The asterisked items will be called here either Serious or Pathognomonic in the text and inventory. Those not having an asterisk are posited to be potential signs or "soft signs" that may accompany more serious symptoms and add to the degree of disfunction, but that in themselves are not considered pathognomonic of major disorders. It is also possible that some of these signs reflect transitions into or out of more serious psychiatric conditions and so are useful for monitoring improvement or regression.
STAGE 4 - MPI PROFILE ANALYSIS

The specific codes are transformed into scale scores and arrayed on the Profile Analysis, page 6 of the MPI. The rules for transforming codes of MPI categories 1-X are defined in the key at the lower part of page 6. The ten primary categories are listed first with space for noting which subsystems are involved. Entries to the left of the vertical line under "Subsystem involved" refer to those subsystems in which an asterisked item is observed; entries on the right are for those receiving only scores of 1 (less serious). Each category receives a scale score: 0 means no patterns within this category were seen in the session under study. 1 means patterns designated "less serious", i.e. those without an asterisk were observed. Scores of 2 or 3 mean that at least one code in this category was asterisked. Note that in the MPI coding sheets, scores of 1 and 2 indicate relative frequency or predominance of a pattern. However, when used in the Profile, 1 and 2 distinguish "less serious" items (level 1) from presence of asterisked items (level 2) while a score of 3 indicates high incidence of level 2 patterns. All subsequent discussion of scores of 1 or 2 on the Profile and their interpretation refers to level 1 and level 2 distinctions, not frequency.

Scaling for Limited Communicative Repertoire (LCR) is separate from that of the ten core categories. It is the only category based solely on certain items of Page 2, the Action Inventory. Scoring criteria for LCR are listed below those for the MPI categories 1-X on the Profile Analysis sheet. For most projects, observer reliability can be assessed in terms of scores on the Profile as this is the primary basis of interpretation. However, if there are serious differences between observers at this level, careful examination of specific codes to identify the sources of the differences is important. Further work on reliability training may be needed, and consensus on conflicting codes of the Profile must be established before interpreting the Profile.

STAGE 5 INTERPRETATION

Profile scores of 2 or 3 in any of the ten core categories are by definition predictions of severe psychopathology. Even one incidence of an asterisked pattern earns a 2 in its respective category and engenders an interpretation of severe psychopathology, reason again for conservative scoring of these nominal codes.

Scores of 3 on any of the ten categories mean there is a moderate to high incidents of the factor, very strong evidence of severe pathology. Note that a person is not likely to display most or even many of the 50 patterns listed in the MPI. Today, with medication, short hospitalizations, and out-patient treatment, psychiatric patients with acute psychotic symptoms or long histories of psychiatric disorder do not constantly display very disturbed movement all the time they are communicating with someone. The patterns are often subtle and fleeting. They may not "look" like patients in any obvious way. Most Profiles will not show 3-level scores (for high frequency) or entries in a wide range of factors. The patient profiled at the end of this text displays patterns in five of the ten factors, four of them at the 2-level. At first glance this might seem a low or moderate range of pathology, but it is, relatively speaking, very high and severe.

Note that "Limited Communicative Repertoire" is separate from the ten primary categories. As discussed earlier this category is based on codes from the Action Inventory. It is not used in the differential diagnosis because the motor restrictions and limitations captured by this coding are very ambiguous. It is useful as an additional indication of level of functioning in interpersonal contexts, a supplement to the Profile proper. It may also be useful in situations in which there is a question as to whether the disturbance is feigned. Arguably, it is easier to obtain a high score on the Limited Communicative Repertoire because individuals can more easily control "what" they do than "how" they do it. Feigning would be in question in a Profile with a high LCR score but no codes within the ten MPI factors.
There are three ways in which degree of disturbance is reflected in the Profile. One is the relative score for each category (0 to 3). Another sign is the number of different categories marked 1 or higher. The third way is the degree to which different subsystems are involved. All of these indications may be considered in an assessment of level of disturbance. It is possible to generate an overall score, summing the number of features observed for a general index of degree of dysfunction. However, care must be taken to weight "pathognomonic" features much more than 1 scores. Until there is research evidence to the contrary, even high incidence of the "less serious" features should not add up to severe psychopathology or be regarded as having the predictive power of even one or two "pathognomonic" features.

The MPI Profile gives an indication of the degree and range of psychopathology and how pervasive it is in various activities. "Mental health" is reflected in the absence of these features. More accurate indication of strengths and overall level of functioning would require supplementing the MPI with a more comprehensive analysis of the person's movement repertoire. This is why it is recommended that the MPI be accompanied by a Movement Signature Analysis that presents a picture of the range of the person's movement, especially its nonpathological features (See Part 1 of this Guide to Movement Analysis Methods).

The MPI is designed to guard against overinclusiveness and false positives. Individuals with histories of major psychiatric disorder may not be identified, either because they did not display any of the patterns regarded as pathognomonic or because observers are required to be extremely conservative and exclude debatable observations that might in fact be relevant. The MPI loses its diagnostic potential and generates ethical and clinical problems if it is overinclusive. False negatives should be dealt with through more research on observer agreement and "A" codings that suggest emergence of the pattern. The present stage requires maximum care to avoid false positives.

Initial research indicates that different configurations of MPI features may correlate with different diagnoses (Davis, 1970). What follows are hypotheses as to how to interpret specific Profiles. Schizophrenia Undifferentiated Type or Schizophrenia Disorganized Type (295.9x or 295.1x) are indicated by scores of 2 or 3 on Disorganization and Immobility and one or more of the following: Perseveration, Low intensity, Low Spatial Complexity, or Diffusion. Schizophrenia Catatonic Type (295.2x) would be indicated by high (2 or 3) scores on Immobility or very high (3) on Hyperkinesis with or without Exaggeration and no high scores in the other categories. Schizophrenia Paranoid Type (295.3x) may be indicated by high scores on Disorganization and Even Control with or without high scores in Exaggeration, Immobility or Perseveration. However, this Profile is more likely to describe chronic Schizophrenia with marked paranoid symptoms. (See the example presented at the end of this section.)

Patients in acute paranoid psychoses may be difficult to identify with the MPI. There may be nothing coded in the ten MPI categories and the person may display a rather animated and demonstrative expressive repertoire. Other patients diagnosed as suffering an acute paranoid psychosis or a Delusional (Paranoid) Disorder may display only minor signs of control problems in the movement, such as a rating of 1 on Category X (Even Control) or V (Perseveration). It is quite possible that movement correlates of paranoid features, such as delusions or marked use of the defense of projection, require more subtle discriminations than are made at this point in the MPI. This possibility is currently being explored.

An MPI Profile that involves scores of 2 or 3 on Low Vitality and Flaccidity/Retardation and no other features suggests Major Depression without psychos. If Flaccidity patterns occur with Diffusion and evidence of more disturbance in Intensity features, serious suicide potential should be considered. Signs of Flaccidity or Retardation with high scores in Disorganization, Perseveration, or Immobility would suggest depressive symptoms within a schizophrenic process.
High rates of Exaggeration and Hyperkinesis features alone would raise the possibility of a manic state within a Bipolar Disorder. The challenge of distinguishing a manic state from acute paranoid agitation is, of course, obvious here because presence of features in the movement categories related to "grandiosity" (Exaggeration) and agitation (Hyperkinesis) and absence of any other features may be the same for both diagnostic groups. The differential must be more subtle, such as higher scores on Hyperkinesis than Exaggeration for the manic state or different patterns within the subsystems. This is currently being researched.

Severe forms of Immobility, Low Intensity, Retardation and Low Spatial Complexity raise questions as to the presence of medication effects. It is possible, for example, that effects of phenothiazines appear in features from these categories before motor symptoms are clinically identified as severe enough to warrant medication change. These factors may also provide more explicit operational definition of what is generally referred to as "flat affect". The degree to which medication effects can be discriminated from "flat affect" through more refined and operationalized definitions of the movement patterns is a current subject of study. The following hypothesis is being investigated: 2-level codes in these categories are indicative of "flat affect", while 1-level codes are clues to the emergence of medication effects.

A scored and profiled example of the MPI is presented at the end of this section. It represents coding of a patient who was studied from a 35-minute videotape of a therapy session (Davis, 1974, 1985). Both patient and therapist could be seen throughout the session in medium body shots, viewing conditions adequate for an MPI. As per the procedure, the videotape was studied many times without sound before the author learned anything about the patient. The MPI coding presented here is reconstructed from earlier coding as this tape is no longer extant.

The patient, John D., actually shows quite a few MPI features, particularly within subsystems S and P, self-related movements and position shifts. He also displays considerable restriction in conventional aspects of conversation such as looking at and orienting to the therapist, head nodding with listening, and displaying some facial expression. In fact this man spent the first two minutes of the session bent over, elbows on knees, hands covering head so he was not looking at or turning toward the therapist.

In the Profile Analysis the patient displays "pathognomonic" features (2-level) in the self-related movements and less serious features (1-level) within self-related moves and positions shifts. Beyond that, the pathology is displayed within the conventional communicative behaviors (LCR score). Note that the occurrence of various patterns varies according to the phase of the session. For example, this patient displayed exaggerated and perseverative features in self-related movements in certain phases, the hyperkinetic, high tension position shift patterns in other phases, and no motor pathology in still other phases. The MPI summarizes the pathological features observed in the entire session. Examination of how the features vary during the session would give information about clinical state changes. For methods of analyzing these patterns in relation to the interaction process, see Part 3 of this guidebook.

This patient displays considerable "inappropriate" social behavior as seen in the Communicative Repertoire rating of 2. Could the diagnosis be inferred simply from what the patient did--covering his head, not looking at the therapist, rocking up and down, and later repeatedly pinching his face--behaviors coded in the Action Inventory, p. 2. The Profile based on codes of the ten primary categories suggests a diagnosis of Chronic Schizophrenia with marked paranoid symptomatology, a diagnosis confirmed by independent psychiatric assessment. One might predict this diagnosis from such strong avoidance behavior and vigorous rocking, but these signs are still ambiguous. They do not distinguish this patient, for example, from a nonpsychotic person who is being evasive and hostile to the interviewer. The MPI is based on the assumption that
the reliability of a diagnosis from body movement depends on accurate assessment of how one performs such behaviors, not simply on what one does.

Finally one may make interpretations based on the differential display of certain patterns. The patient in this example limits his more severe movement pathology to pinching motions performed in a fragmented way, suggesting that under maximum stress he can become very isolated and regressed. A positive sign is the degree to which he can become organized and appropriate in expressive manner fairly quickly after periods of disorganization, at least in contexts in which he is being treated with great consideration and empathy as he is in this session. The movement analysis is completed before observers hear the sound or learn about the patient from staff or records. It was not surprising to learn that the therapist considered this was their "best session". Certainly the degree of synchrony, mirroring of positions, and coordination of the movements of patient and therapist was remarkable (cf. Davis, 1985).
References
Part 2 MPI


Eggena, B. (1979). Involuntary movement checklist. Unpublished coding instrument. A modified version of this, the Drug-Induced Motor Symptom Evaluation (DIMSE), can be used to supplement the MPI. Contact M. Davis (1 West 85th Street, NY, NY 10024).


National Institute of Mental Health, Abnormal Involuntary Movement Scale (AIMS) may also be used to supplement the MPI for evaluation of tardive dyskinesia.
MOVEMENT PSYCHODIAGNOSTIC INVENTORY

Subject J. D. ID # Context therapy sess. Duration 35'
Observer Observation date(s)

CAMERA SHOT DISTRIBUTION

<table>
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35' Recorded X Estimated

35' Totals

Locomotion on video no. Standing and/or sitting moves on video no

Movement Signature Analysis (MSA) Selected Segment(s):

COMMENTS:

session with Dr. Harley Shands
see Davis (1983, 102-5)

CODING KEY:

0 = none, never seen
1 = rare (1-3)
2 = some or frequent (unless noted otherwise)
A = Almost recorded, seriously considered
Z = Data unavailable, not applicable

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ACTION INVENTORY

1. Gesticulations, gestures accompanying speech: 0 1 2
2. Emblems, gestures without speech, e.g. shrug:
3. Repetitive actions, e.g. rocking:
   Describe
4. Self-touching, e.g. scratching:
   Describe
5. Instrumental actions, object handling:
   e.g. smoking, drinking activity (2 = 50% of session)
   Describe
6. Speaks entire turn without looking at listener
   (0 = no turns  1 = 1-3 turns  2 = 4+ turns)
7. Holds gaze away from speaker when addressed:
   (0 = no turns  1 = 1-3 turns  2 = 4+ turns)
8. Head orienting in conversation:
   (0 = at least sometimes  1 = rarely  2 = never toward)
9. Trunk orienting in conversation:
   0 1 2
10. Head movements with speech:
    0 = clearly accompany  2 = none
    1 = nods or shakes only or very rare accenting moves
11. Listens with head nods "yes" or "no":
    (0 = at least sometimes  1 = very rarely  2 = never
    Describe
12. Facial expression held longer than 15 seconds:
    0 = none  1 = once or twice  2 = often
13. Different resting or "homebase" positions:
    0 1 2
14. Phrases of postural shifts:

SUB-SYSTEM

Gesticulation
Self-related
Instrumental
Orienting
Head Moves
Facial Expression
Position/Posture

Subject  J. D.  Observer  mD  Date  MPI-2
I. DISORGANIZATION

*1. Effort flow or weight fragmentation; very erratic fluctuations or breaks in fluency or emphasis.

*2. Sporadic, sudden movements as if “out of nowhere”.

*3. Hand fragmentation: fingers hyperextended, flexion/extension only at knuckles and/or wrist.

*4. Body fragmentation: movement occurs sporadically in different body parts during a phrase without a coherent sequence or fluid connections.

*5. Sequence of weight shifts and/or weights in allines disorganized; e.g., one part shifts, then another in a different direction, etc., and/or body does not come to balanced rest.

*6. Different movements performed simultaneously in different parts of the body, unsynchronized.

*7. Spatial/lateral disorganization in upper limbs; as two limbs move, changes in their directions are unsynchronized and/or there is no clear bilateral coordination.

*8. Spatial contradiction: one part moves in one direction while another goes in opposite direction several times.

*9. Flow contradiction: e.g. one body part moves with very bound flow while another is limp or in free flow.

*10. Spatial segmentation: entire movement phrase is broken up with perceptible pauses between each change of direction; series of one-phasic moves in the air.

*11. Body segmentation: isolated use of one part; a pause or clear separation before movement of another part.

*12. Action segmentation: string of short but complete action phases that alternate or repeat such that they segment each other and break each other up, e.g. waves hand, then rubs chin, then waves, then rubs, etc.

II. IMMOBILITY

*1. No movement and absolutely still except for eyblinks for periods of two minutes or longer (cf. catatonic).

*2. Head still through time observed.

*3. Head still through time observed, fixed shape or position held up in the air and against gravity for long periods of time (30+ seconds).

*4. No position shifts in 20 minutes or more.

*5. Gestural movement only in large body actions, no postural movement in walking (if seen) or when shifting positions of trunk or legs.

*6. “Fleeting” or single phases of postural movement in locomotion and whole body or leg position shifting.

*7. Only one or two position shifts in 20 minutes or more.

*8. Distal parts only move while seated or standing in place (e.g., hands, feet, head, arms) through entire session.

*9. Fixed or held body configuration through session, e.g. fixed finger-hand position or arms held still.

*10. Little or no movement of face apart from eyes.

*11. Arrests specific action midway and holds for 15+ secs.

*12. Very low rate of postural movement (e.g., 1 phrase per 30 minutes).
III. LOW INTENSITY

G_S1_H_F_P_ *1. Very little fluctuation in effort flow and/or neutral range of flow in movement; flow changes hard to see.
G__ *2. No effort qualities (space, weight, time variations) visible in any movement during the session, including gestures.
G__ *3. Only rare, fleeting occurrence of single effort qualities.

IV. LOW SPATIAL COMPLEXITY

G_S1_H P__ *1. Movement has no clear directionality or projection into space; only shape flow throughout session.
G__ 2. Any spatial complexity (i.e., shaping, clear directions, curved transitions, projection into space) restricted to hand or forearm.
G__ 3. Two-phasic or single phase of fleeting directionality within phrases of shape flow variation.

V. PERSEVERATION, FIXED-INVARIANT

G_S1 P__ *1. Repetition of one or two effort qualities in an unvarying way; stays intense and has no build up or decrease; phrase has clear beginning, ending.
G_S2_H P__ *2. Repetitive movement of one isolated body part; tempo same throughout; action appears to “go by itself” unrelated to rest of body.
G_S1 P__ *3. An action apparently related to some expression or conventional action but unvarying in performance, each repetition dynamically the same.
G__ 4. Moves strictly in one plane or axis per phrase.

VI. FLACCIDITY OR RETARDATION

P__ *1. Flaccid, inert, limp trunk tonus throughout.
P__ *2. Flaccid, complete limpness, giving into gravity in still limbs most of session.
P__ *3. Flaccid, complete limpness and giving into gravity at end of several gestures or upper limb actions.
P__ 4. Retardation: Entire action performed with slowness or with a level of tension and lack of acceleration such that activity is of long duration.

VII. DIFFUSION

G__ H__ *1. Movement spatially diffuse and unclear through entire phrase (i.e., absence of straight, round or 3-D paths or transitions); difficult to discern phrase.
G__ *2. Continuous diffuse effort pattern through entire phrase; flow and possibly effort qualities ‘running on’; difficult to determine distinct phrases and clear build up or die down in intensity; No clear endings to movements.
G_S1_H F_P__ 3. Overlapping actions; particular action not completed before person starts new action; no pause or transition but a kind of diffuse overlapping.
G__ 4. Diffusion (spatial or dynamic) in one part of phrase. Part of an otherwise clearly defined phrase is diffuse spatially or dynamically.
VIII. EXAGGERATION

G_S_I_ *1. More postural or large limb position shift phases than gestural phases within a phrase that emphasizes limb activity (e.g. gesticulation or instrumental action). Locomotion or standing/sitting excluded.

G_S_I_H_ P_ *2. Large, exaggerated movements through phrase; i.e. no modulation in large size within phrase.

G_S_I_H_F_P_ *3. A "conventional" gesture or action that is bizarrely exaggerated.

IX. HYPERKINESIS

P_ *1. Three or more phrases of large limb and/or trunk shifts within 15 seconds or less (excluding instrumental activity and gesticulating periods).

S_I_ P_ *2. Three or more phases of peripheral limb position shifts within 15 seconds, i.e. hands, forearms, lower legs (excluding instrumental activity and gesticulating).

G_S_I_H_F_P_ *3. Activity or action performed very rapidly either because each phase is done without pause or deceleration or because there are repeated instances of the effort quality of suddenness throughout.

*X For Extreme Forms of This Pattern Only.

X. EVEN CONTROL/SUSPENSION

G_S_I_ P_ *1. Suspended in space: movements and still positions are without time variations, suspended, and possibly light throughout; weightless and surreal quality.

G_S_I_H_F_P_ *2. High degree of bound flow or muscle tension maintained throughout the entire movement phrase; absence of free moments, release, giving into gravity within the phrase. To be coded most of the movements must display this pattern.

P_ *3. High degree of bound control or muscle tension actively maintained through position repertoire, i.e. in trunk and limbs when still.

Additional observations and comments:

* Asterisked items are hypothesized to be pathognomonic of severe psychopathology. Those without asterisk may contribute to the degree of disturbance, but are not in themselves considered sufficient for diagnosis of severe mental illness until research indicates otherwise. Note that VII. 3. and IX. 3. may be asterisked if they are extreme.
MOVEMENT PSYCHODIAGNOSTIC INVENTORY (MPI) -- Profile Analysis

Subsystem involved

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<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>P</td>
<td>EXAGGERATION</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>GSP</td>
<td>HYPERKINESIS</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>EVEN CONTROL/SUSPENSION</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

OH
LIMITED COMMUNICATIVE REPERTOIRE

0 | 1 | 2 | 3

[✓] Check further for extrapyramidal/organic/medication signs (AIMS, DIMSE)

Viewing conditions adequate (20+ minutes in at least medium shot)
Viewing conditions inadequate:

Scoring for MPI Categories 1-X:
0 = not observed  1 = presence of "less serious", not asterisked patterns
2 = one to three "pathognomonic", asterisked patterns  3 = four or more "pathognomonic" patterns

Scoring for Limited Communicative Repertoire:
0 = some speech gesticulations, head movements with conversation, facial expression, range of homebase positions, and clear orienting to other (2+ gesticulation phases per 10 minutes, at least 3 different base positions, and 0 on 6-12 of Action Inventory).
1 = slight restriction, low score (1 on items 6-12, 1 gesticulation/10 minutes, only 2 different base positions) on 1-3 items of Action Inventory.
2 = notable restriction, high score (2 on items 6-12, less than 3 gesticulations/30 minutes, one base position) on one or two items or low scores only on 4-5 items.
3 = severe restriction (1 or 2 high with 4+ low or high score on 3+ items or low only on 6+ items)

Subsystem Key:
G = Gesticulations  S = Self-related actions  I = Instrumental actions  O = Orienting
H = Head moves with speech  F = Facial expression  P = Positions, Postural shifts and Locomotion

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GUIDE TO MOVEMENT ANALYSIS METHODS

by Martha Davis, Ph.D.
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Part 3: NONVERBAL INTERACTION AND STATES ANALYSIS

NISA

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Not for use or quotation without permission of the author. Correspondence should be sent to Martha Davis, 1 West 85th Street, 1A, New York, New York 10024. This guide is a supplement to the training and practice necessary for reliable coding and analysis. It alone is not sufficient for learning the method.
Nonverbal Interaction and States Analysis (NISA) is a method for coding and analyzing the positions, gesticulations and specific actions displayed by each of the participants in a conversation. It has been developed for psychotherapy process research. While it may be applied to small group and family therapy, it is most efficient for individual therapy and dyads in interviews. NISA coding is based on the assumption that the most reliable and productive psychotherapy study of nonverbal behavior is through a system of detailed nominal coding that requires a low level of inference. As much as is feasible the coding involves exact onset of the behavior in terms that preserve much of its characteristics, not sampling or units defined in clock time. NISA coding reads like a literal, albeit very technical and precise, description of each participant's nonverbal behavior as it occurs in real time.

Once the coding is complete, there are criteria for transforming the specific nominal codes into quantitative scales. Initial research indicates that these scales provide important information about the interaction, such as the development of rapport, and about each individual, such as visible manifestations of psychological defenses. Called nonverbal states scales, these measures are valuable for research on therapy process as well as other types of interviews and conversations in which the examination of affective states and rapport is a salient research goal.

NISA is the result of many years of research on nonverbal behavior in psychotherapy (Davis 1977, 1985, 1986; Davis & Hadiks, 1987, 1990). The coding of positions is influenced by Scheflen (1973) and the assessment of "specific actions" has similarities with several studies on self-related movements (cf Scheflen, 1973 on preening behaviors and "monitoring" actions and Freedman & Grand, 1977 on self-focused movements). The coding of gesticulations adapts terms for qualitative description from Laban Movement Analysis (Laban & Lawrence, 1949, Bartenieff with Lewis, 1980). The criteria for coding and scaling, however, are based on the author's study of over 50 videotaped psychotherapy sessions (Davis, 1975, 1985; 1986). Decisions about what aspects to code and how are based on considerations of replicability, clinical relevance and "perceptual saliency" (i.e., while they may not be consciously perceived during the interaction, the behaviors are perceptible with training which is important if the research is to be clinically useful). Reliability of the coding is reported in Hadiks, 1987, Davis & Hadiks, 1987, Davis & Hadiks, 1990, and Davis & Hadiks, 1991).

NISA is divided into three parts: 1) coding of the onset, duration and characteristics of each change of position, 2) frequency, complexity and dynamic intensity of the gesticulations, and 3) onset of specific actions such as body rubbing, palm presentation, hair preening. There is also space within the Specific Actions coding for note of "special patterns", such as distinctive movement patterns identified in a Movement Signature Analysis of the individual (see Part 1 of this guide) or patterns of movement pathology as defined in the Movement Psychodiagnostic inventory (Part 2 of this Guide). The recording sheets also allow for graphing the onset and duration of each speaking turn parallel with graphs of the onset and duration of series of gesticulations.

* Nonverbal Interaction and States Analysis evolved from two earlier versions of nonverbal process coding: the Davis Nonverbal Communication Analysis System or DaNCAS (Davis, 1985) and Davis Nonverbal States Scales or DNSS (Davis, 1986).
NISA coding requires videotape for repeat viewing. The camera should show each participant in at least a hip to head shot that is continuous. Time in minutes and seconds should be superimposed in the space on the screen above the participants. If two cameras are available for a split screen image, then focus one camera on each participant, preserving the relative angle of their latter positions. Or train one camera on both with the second camera in a head shot of the patient that is inserted in the space just above and between the two. This latter option is preferable when very fine details of the interviewee's gaze and face are needed. If one cannot control camerawork, nonverbal analysis is usually compromised by jumps from one subject to the other and from head to body shots that break the movement up. The one exception is a videotape that shows only the interviewee in medium or full body shots throughout. In this case, one can do a continuous coding of this subject, useful for a speech-motion analysis and for tracking of state changes in that person. However, very important information on the interaction is lost.

Each of the three sections of NISA is sufficiently different that an observer can be absorbed in coding one with hardly any awareness of the other two. These areas or "nonverbal realms" involve quite different dimensions and the easiest way to learn them is one at a time. Each subject is coded separately, often with the view of the other blocked out so that the observer is not influenced by peripheral perception of the other and the interaction. Usually an observer will code one area such as positions, then go over the session and code gesticulations, then do specific actions. Or each of three observers will code a different area. When the recordings of the three "nonverbal domains" are combined on paper, one can see their interrelationships. The method is presented in three separate parts because that is the easiest way to learn them and to do the coding, and because there is some evidence that the three areas constitute discrete "subsystems" related to different psychological phenomena (Davis & Hadiks, 1990). However, this does not mean that positions, gesticulations and specific actions are not coordinated with each other.

Detailed coding by trained observers is the first stage. Once the recording is complete, the codes are synthesized and combined into several nonverbal "states scales" useful for quantitative analysis. The criteria for scaling were determined by the author a priori from consideration of the range of possibilities and from her research and clinical experience as to how to combine various nominal codes into quantitative scales of maximum research and clinical value. All of the NISA states scaling criteria were devised intuitively from experience. However, initial Factor Analysis of the NISA coding items supports this a priori delineation of scales (Davis & Hadiks, 1990; in preparation).
Individuals in conversation can be seen assuming a variety of body positions in listening and speaking. Typically, a person starts from one position, raises his or her arms and makes a series of gesticulations, then settles the arms in another position. Or s/he may be in one position, shift the entire body, orienting and tilting the trunk differently and establishing a different arrangement of legs and arms at rest. In some cases one may be in a given position, reach for an ashtray and perform the activity of lighting a cigarette, then settle back in a different position. In NISA coding, any and all instances of position change are recorded from total body position shifts to changes of only the forearm or lower leg. Small changes in hand resting position are not recorded unless they involve some change in what the hand(s) are touching or grasping.

Below is the top part of the Position coding sheet. Note that it includes a larger square in the upper left corner for the “base” position—i.e., for the position that the observer finds the subject in. If the subject appears on camera in a given position at the start of the tape or if the design of the study requires that observers code one segment at a time (e.g., randomly spliced together so that the sequence does not influence the observer), then the Base position that the subject is “found” in must be recorded in the first square with note of the beginning of the segment in minutes and seconds written in the upper left corner. If, when the segment starts, the subject is seen in motion, then the time in which the position is finally established is written in the time onset box. Note that the squares provide space for coding quite a number of details. Also, they each have a small square in the lower right that allows the observer to “draw” the position in a stick figure for easy visual recognition.

Position is defined here as an arrangement of resting limbs, trunk orientation and lean that is maintained for four seconds or more. People talking and listening usually display a repertoire of “rest” or, what will be called here, “homebase” positions, e.g., legs crossed at the knee, hands folded on lap, trunk leaning back. These are among the easiest details to recognize. While many positions may be maintained for several minutes—the gesticulating hands returning each time to the same position—there are also positions that are assumed for brief periods. There are two criteria for determining a position: 1) if the new trunk placement and/or arrangement of limbs is maintained for at least 4 seconds, or 2) if it is "repeated," i.e., assumed for 1 or 2 seconds followed by gesticulating or other activity and then returned to. In either case the person has to put the limbs down or support them against gravity. Hands held up in the air during a gesticulation are considered pauses within the gesture, not positions.
The position "onset time" is defined as the moment to the nearest second in which the position is established. That means that the coder watches for how long a new position is held and as soon as it lasts 4 seconds, he or she goes back and records the onset time at which every part of the body (except the head and face) became still. If the new position is fleetingly assumed, the subject keeps gesticulating and then goes back to the new one; the repetition defines it as a new "homebase", and the coder records the onset time as the moment of first placement.

Often an individual may start to shift positions, e.g. moving forward then leaning back to the other side, but will keep gesticulating so that while the observer can see the person has assumed a new position of trunk and legs, it is not clear where the arms will settle. In this case two onset times may be written, the point at which the trunk and legs are settled, plus the time in seconds at which the arms establish a new "homebase". The onset time of the trunk and legs position is written in the "onset box" and the onset time of the new arm position is written in the space above the "symmetry" section on the right (see first illustration below).

If the subject starts to change position and keeps moving for 5 seconds or more before settling the body, then the time at which the change began is written above the onset box and the time of finally settling is entered in the onset box. If there is only one time entered, then it is assumed that the position shift took 1-4 seconds before the recorded onset time to complete. Note that the coder must judge that the person is truly "at rest" and that trunk, legs and arms are supported. If any part is held up against gravity, the position has not been established. Note that these refinements of onset time are used only for gesticulating that runs 4• beyond the point at which trunk and legs appeared settled. If the subject shifts the body and keeps active, e.g., manipulating an object such as a pack of cigarettes, onset time is not recorded until the arms come to a rest.

Such care is taken to record the onset times of new "homebase" positions because these are important for defining natural units of behavior, parsing the activity and defining phrases. They are in one sense the punctuation of the person's activity and the markers of units of interaction. In practice, position shifts usually are not very complicated and often involve only new arrangements of the arms.

POSITION CODING

Each position shift is recorded in a new coding "box". The following aspects of positions are coded:

1. TRUNK LEAN—in terms of five degrees as follows:

   Upright = shoulders directly above hips whether subject sits with back off chair or against back of chair.
   Back = perceptible lean of trunk back against chair with slight right or left tilt possible; the shoulders should not be tilted beyond the hips.
   Right = lean with right shoulder tilted past right hip, weight to the side but not forward of hips.
   Left = lean in which left shoulder is tilted to the side past left hip.
   Forward = any tilt in which the shoulders are shifted forward of the hips.
The ranges of each lean possibility can be diagrammed as follows:

2. KNEE WIDTH—In the lower left quadrant of the coding box, there is space to indicate whether the knees are held close together, slight apart or widely apart. The criteria for knee width is based solely on the lateral dimension. It is possible for the knees to be separated yet laterally quite close, e.g., when the subject crosses his or her legs with one held high over the other by clasping the hands around the knee and pulling the leg up.

Close = any position in which the knees are tight together or crossed one atop the other.
Neutral = a range from perceptible space between the knees in the lateral dimension to the "open" range.
Open = any position in which the lateral distance between the knees is greater than that defined when the knees are exactly aligned with the hips.

3. UPPER TRUNK ORIENTATION—The orientation and facing of the upper trunk is judged relative to the person addressed.

Toward = A virtually frontal vis a vis. "Toward" means the subject is oriented frontally to other, irrespective of the trunk orientation of the other.
Neutral or Deflected = Upper trunk facing slightly away, roughly 3 to 15 degrees from a full frontal orientation.
Away = Upper trunk is oriented markedly away, more than 15 degrees from a full frontal orientation. The coder is not expected to measure degrees, this is a rough guideline. The observer may use room guides such as the wall next to the subject if a frontal orientation would put him or her perpendicular to the wall. Or the observer may be able to use the chair legs as cues. If there is any ambiguity, the observer should define the criteria and cues being used.

4. LOWER TRUNK ORIENTATION—The same criteria are used for lower body orientation, i.e. the degree to which the pelvis is "facing" the other. Toward, Deflected, Away. It is important to judge upper and lower trunk facing as independently of each other as possible. Sometimes it is helpful to block out one to judge the other "on its own merit".
5. ARM AND LEG ORIENTATION—A distinction is made between the orientation of the trunk and the "orientation" of the arms and legs. If one sits in such a way that the arms or legs define toward and away, then an additional refinement is coded in the Trunk Facing section. For example, if one sits with trunk oriented away from the other but the arm closest to the other person is pulled back and to the side while the other arm is extended over the leg, the arms in effect define a limb orientation toward the other person. Similarly the legs may be arranged in such a way as to define a "facing away" from the other that would qualify the lower trunk orientation. Arrows for toward and for away are written on the appropriate circles. The example below reads: upper trunk away countered by toward in arms, lower neutral trunk countered by away in the legs.

6. ARM WIDTH—two degrees of position arm width are coded in terms of the lateral relation of the elbows to the torso. If both elbows are markedly away from the sides of the body, W for wide is written in the middle upper space. If the person assumes a position in which the elbows are closer together than the distance defined by elbows tight to ones sides, then C for "close" is written in this space. Note that these are extremes, the elbows have to be either well away from the sides (about 6 inches or 2 fists) or so close they are approaching the midline of the body. If the width on one side is more pronounced than the other, the criteria apply to the total elbow width.

7. HAND HOLDS*—The observer records any positions in which one or both hands hold objects or are placed together. If the hands are one over other, folded, intertwined, etc., X is written in the "cup" of the hold space at the top of the square. If an object is held, an R or L is written on the horizontal line to indicate whether the right or left hand is holding the object, while the name of the object is written in the "cup". For example, means right hand holds cigarette. Although hand to face is noted, possibilities in which the hand is resting on lap or chair arm are not.

8. ARM SYMMETRY—if the arms are held in a virtually parallel, mirror position at the same level, i.e. are symmetrical, an S is written in the right hand space within the coding square. Small deviations in hand position do not count if the arms are different (even if only minor differences in degree of flexion or height), S is written in this space.

* The hold sign is adapted from the Labanotation sign for relationship. (Hutchinson, 1970, p. 503).
9. LOWER LEG EXTENSION/TUCK—When both feet are tucked back under the legs such that the toes are back of the knee, the coder is to put a symbol in the lower circle. If both legs are fully extended, a symbol is written. Note that this is done only when both legs are tucked or fully extended, not just one. This also needs a cancellation sign when the feet are placed on the floor with the legs bent.

CODING:

<table>
<thead>
<tr>
<th>Legs Extended</th>
<th>Lower Legs Tucked</th>
</tr>
</thead>
</table>

10. SWIVEL CHANGE—If the subject is sitting in a chair that can swivel, note is made of those instances in which the chair is clearly swiveled and held in the new orientation for four seconds or more, provided it does not change the degree of upper or lower trunk facing. Swivel is recorded relative to the person addressed.

CODING:

Swivel Toward Other \( ST \)  Swivel Away \( SA \)

Note that this recording is secondary to judgments of upper and lower trunk facing. The coder first decides if a swivel "affects" the judgment of trunk orientation and changes it. If so, trunk orientation is coded, not swivel. The swivel codes are for those instances in which the body shifts in orientation but remains within the same facing range.

In this sense it is possible for someone to make a perceptible swivel toward or away from the other without chairs that swivel. The swivel detail is reserved for those instances in which the body is turned toward or away from the other but not enough to change the trunk facing codes.

11. ABORTED POSITION SHIFTS—Sometimes an individual will start to change his or her body position, go through an active rearranging of the lower limbs and/or shifts of the trunk, but return to exactly the same position. This special case is called an "aborted position shift" and is given its own recording box and onset time. To code this the letters \( AB \) are written in the lower stick figure box to indicate that a major position shift was begun, but led to no change.

Additional Notes on Position Coding:

--- Every position change or aborted shift requires a new recording "box". This is true even if the only change is a detail that is cancelled. Only changes are recorded. If a detail is noted and the next position recording shows changes in other categories, it is to be assumed that the original detail persists in the new position. For example, if the first position shows a left lean and the second position notes only a leg tuck, then it is assumed the person is still in a left lean. Note that the "Starting Position" must have information on all of the major aspects of position: lean, upper and lower facing, width in the lower and symmetry, as well as note of arm width, hand holds, and leg extension when relevant.

--- If at the end of a segment, the subject begins a position shift the completion of which is not viewable, then the coder should write the time the shift begins in parentheses with the words "uncompleted".
If trunk orientation or lean change, they change to something else that is coded, so it is understood that if there is no new orientation or lean recorded, the previous one is being maintained. However in the case of features such as hand holds, leg extensions and leg tucks, it is possible that the individual "undoes" the action without it being replaced by something else. In these cases, a release or cancel sign (A) is needed. For example, it is possible that the only position change within a recording box is the cancel sign in the leg tuck/extension space. This means that the legs were shifted to some range under the knees (such as when feet are flat on floor)—neither fully extended or tucked back relative to the knees.

If the observer has difficulty making a judgment, he or she should write A next to the notation that was almost recorded. Only observations that one can make with confidence should be recorded. However, the "A" notation may be useful in the assessment of observer differences, as well as indication that this is an aspect of the person's nonverbal behavior that is ambiguous or too subtle to judge with full confidence, or for which the coding is somehow not suited.

Wherever in the coding there are references to right and left, this means relative to the subject. For example if an R is circled in position lean, this means to the subject's right. The one exception to this rule is the figure drawing itself. When making a figure drawing of the new position in the small lower right square of the position square, the observer is to draw it as seen, i.e. from the perspective of the observer. This means that the observer's left is the subject's right, so to avoid any ambiguity, the letter R can be written in the first "base position" box at what is the subject's right. In this box the observer should also add an arrow with the figure drawing to indicate the location of the other interactant as illustrated:

![Figure Drawing](image)

Key: upper lean right with toward orientation, lower neutral open with neutral orientation, arms asymmetrical in base position; lean left at 3:52, rest stays same

Right and left information is complex: the subject's right side is the other's left if they are facing, and if they are not in a complete frontal vis à vis, lean to right or left become toward or away depending on the seating arrangement. Later analysis may involve questions as to the pattern of lean in terms of toward and away from the other or limb position mirroring between the interactants, left side of one with right side of the other. This information is preserved in the NISA position codes and figure drawings and can be extrapolated from them—or the researcher can decide to add codes for these details to the NISA coding.

**POSITIONS STATES SCALING**

As the coding indicates, positions can display great variety because of the many possibilities of trunk lean and orientation, arm and leg arrangements, hand placement, symmetry, etc. Still, most subjects display a limited range of positions and repeat them in a given context such as therapy. And certain positions from one's "position repertoire" may be assumed at special times within the therapy session. For example, a therapist may assume a specific position as he starts to make an elaborate interpretation (Davis & Hadika, 1991).
Because positions are such valuable markers of naturalistic units of behavior and appear to be critical to the organization and structure of the interaction, NISA coding of positions is precise as to onset time and more detailed than is necessary for the positions states scaling. If deriving the position states scale scores is all that is needed for a project, then coders have only to record upper and lower trunk orientation plus any limb "facing" qualifiers and cases of forward and upright lean. However, the addition of the other position coding details facilitates analysis of interaction sequences and patterns of position matching and mirroring between interactants, as well as discoveries of relationships between specific positions, other dimensions of nonverbal behavior, and the verbal content.

Position states scaling is based on the assumption that the degree to which one is oriented to the other is related to salient aspects of rapport and defensiveness. It is called "Position Accessibility Scaling", a physical sign of the degree to which the person is toward and open vis-à-vis the other that is hypothesized to relate to changes toward greater or lesser psychological openness and rapport. This hypothesis is implicit in several studies of position changes in psychotherapy (cf. Scheflen, 1973 and Chaney, 1966). NISA position states scaling is an advance on earlier research because it is a replicable method for nominal coding of a vast range of positions in a format that facilitates the second stage, scaling for quantitative analysis. Moreover, the way in which the detailed coding and subsequent scaling is operationalized facilitates comparison with other studies of positions. As much as possible the scaling preserves the "logic" of how body positions are organized and supports the intuitively compelling notion that the larger and more central the position shift, the more important and pivotal it is as a demarcation of clinical state and interaction changes.

NISA position scaling can be done one of two ways: gross or fine. The 4-point Position Accessibility Scale—written with Roman numerals from Level I (least accessible) to IV (most frontally oriented)—is based primarily on upper and lower trunk facing patterns:

- **Level I**: All positions in which upper and lower torso are oriented away from the other, i.e., A/A

- **Level II**: Positions displaying a) deflected or neutral orientation of upper and lower trunk, N/N, b) upper away and lower neutral, A/N, c) upper neutral and lower away, N/A, or d) upper and lower in opposites of toward and away, T/A or N/T.

- **Level III**: All positions involving a toward and neutral combination, i.e., T/N or N/T except those that involve upright or forward leans.

- **Level IV**: Toward and neutral pairs (T/N or N/T) combined with upright or forward lean or all positions with upper and lower trunk toward (T/T).

* The scaling criteria presented here are used in Davis & Hadiks, 1991. The scaling criteria for the earlier version of position coding (Davis, 1986) were used for studies reported in Hadiks (1987) and Davis & Hadiks (1990). The earlier position coding combined judgments of trunk and limb orientation and incorporated more details of the positions. The present coding is more streamlined and separates coding of trunk and limb orientation which makes it easier and more reliable. However, the differences in the scales generated from these coding differences are so minor that the results of these studies may be compared.
For finer-grained position scaling, each of the four levels are divided into three. The codes for discriminating points on the 12-point Accessibility Scale are the limb facing patterns indicated by the arrows that are added to Toward, Neutral or Away in trunk facing, e.g. (f). In other words the arm and leg arrangements that contribute an additional element of toward or away by dint of their placement and marking off of the space vis a vis the other are used here to further "qualify" the more central trunk orientations. Arrows up designate toward, arrows down mean away and no arrows indicate the limb arrangements do not further define orientation vis a vis the other. The finer scaling from 1 (least accessible) to 12 (most frontally oriented and toward) is as follows:

- **Level I**
  - + arrows down (↓) on upper and/or lower circles = 1
  - + no arrows or a combination of up and down arrows = 2
  - + one or two upward arrows = 3

- **Level II**
  - + one or two ↓ = 4
  - + none or combination of ↓ and ↑ = 5
  - + one or two ↑ = 6

- **Level III**
  - + one or two ↓ = 7
  - + none or combination of ↓ and ↑ = 8
  - + one or two ↑ = 9

- **Level IV**
  - + one or two ↓ = 10
  - + none or combination of ↓ and ↑ = 11
  - + one or two ↑ and/or upright or forward lean = 12

Position coding is done according to exact onset, i.e., the second in which the subject settles into the new position. This means that a diagram of the changes in position level is easy to create; one makes a graph with the level changes marked at points in clock time for the duration of the session.

However, for some projects fixed-time intervals need to be superimposed on the continuous recording to facilitate quantitative analyses. For example, comparisons with gesticulation scaling based on 30 second intervals require that the position scale scores be adapted to these time units. One way to do this is to designate the position level of a given time interval as that which persists for more than half the time unit. For example, if a position scaled at level 6 lasts for 20 of the 30 second unit, 6 is entered. If there are two or more changes within the interval, one level must be selected. Averaging scores in this ordinal scaling is not desirable; selecting the one that lasts the longest is preferable.

**Basic vs Comprehensive Coding**

As can be seen there are many details of the coding—knee and elbow width, swivel, lean variations, grasping patterns, etc.—that are not used in the construction of the Position Accessibility Scaling. They may be regarded as an optional, more comprehensive coding compared with the "basic" coding needed for the Accessibility Scaling. Though optional, the additional position variations are considered a vital part of the position coding for several reasons. First, they are useful for analysis of the interaction, because along with the limb arrangements and orientation, these may be details that are mirrored, echoed, matched in the other's positions. Secondly, they contribute information on the organizational structure of the dialogue, marking smaller units than may be demarcated by the limb and trunk changes incorporated into the Accessibility Scaling. Thirdly, they are useful for further analysis of "Accessibility" and
NISA-11

rapport, constituting a "tertiary level" in which relative width of limbs, openness of hand positions, extension or retraction of lower legs, etc. define even finer degrees of open and toward the other. Fourth, they may be useful in a study of the magnitude of the position shift in relation to the interaction and dialogue. For example, therapist's interventions may be preceded by more extensive position shifts involving larger body units then by stillness or small position changes (Davis & Hadiks, 1991). Finally, these additional details are easy to code, do not take much time, and facilitate training, because sometimes observers will agree a position change occurred but will differ as to how. These details help clarify the nature of the change.

Position Relationships

There is considerable evidence that people in conversation may display striking relationships between their positions and movements (cf Scheflen, 1973; LaFrance, 1982). In NISA both participants are recorded separately and then relationships between their actions are systematically examined. There are several ways to analyse these relationships—from the visual and intuitive to statistical and quantitative. For example, Davis & Hadiks (1991) found a statistically significant relationship between the patient's and therapist's position "Accessibility" scores. Moreover, certain relationships may be ones of dynamic complementarity or counterpoint, not convergence or matching. For example, Davis (1985) detected a dynamic complementarity between the moves of the therapist and a very disturbed patient: disorganized states of the patient matched by higher spatial clarity in the gestures of the therapist.

Of course, many relationships are not visible to the naked eye; they are detectable from careful examination of detailed coding or from quantitative analysis of many sessions. The more dramatic relationships are those that hit the eye—when patient and therapist simultaneously shift positions (synchrony), when therapist scratches his chin and two seconds later the patient makes a similar action (echoing); when both patient and therapist are found in mirror positions (right of one subject same as left side of the other or identical positions (right sides same, left sides same). These graphic displays of "getting together" are detectable in the NISA coding; i.e. one can examine the recordings and figure drawings for synchrony, echoing, mirroring and identical positions once the coding of both is completed. Such a scan could generate a "nonverbal rapport" scale that could be constructed in terms of incidence (0 = none, 1 = one occurrence, 2 = two types or occurrences per 30' interval). However, the researcher who wishes to highlight these features may find it more efficient to have the observer(s) code them directly. In this case the observer may add special codes to the position coding sheet. (This may also be done in the appropriate Gesticulation and Specific Actions spaces if one wants to search for relationships in all of the activity). The following symbols for relationships can be placed next to the feature(s) involved on the coding sheet:

- \(\) = simultaneous change, synchronous moment
- \(\rightarrow\) = echoing (one shift or action followed within 3' by same action of other
- \(\leftrightarrow\) = mirroring of positions or actions, right with left
- \(\equiv\) = identical, right of one with right of other, left with left

If the relationship is a sustained position, than note can be made of who "joins" at what time followed by who shifts out of it and when as follows:

\[\begin{array}{c}
P_{1:02} \\
p_{1:06}
\end{array}\]

\[\begin{array}{c}
P_{1:02} \\
\wedge
\end{array}\]

(P 1:02 = patient mirrors therapist position at 1:02, \(\wedge\) = "cancelled" by patient shift)
GESTICULATIONS

Individuals in conversation often accompany their speech with hand/arm gestures. The longer the speaking turn, the more likely there will be gesticulating during it. While it is common for someone to ask brief questions or make remarks without gesticulating, absence of any gesticulation in a protracted conversation is noteworthy (see Part 2 Movement Psychodiagnostic Inventory discussion of "action inventory" items). Gesticulating is defined as the movements of the hands/arms that appear to accompany or substitute for speech. This excludes upper limb movements involved in establishing a position, functional activities such as lighting a cigarette, or self-touching (except when pointing to oneself as part of the conversation). As will be seen, most of the NISA gesticulating codes are based on the unit of "phrase". A gesticulation "phrase" is defined as movements in the air accompanying speech that are bounded by "homebase" positions and/or functional activity. As in Position coding, "homebase" positions are defined here as supported arrangements of trunk and limbs that last for at least four seconds or are demarcated by repetition. Gesture phrases typically last from one to five seconds and almost none are as long as 30". Most continuous strings of gesticulation are punctuated by very fleeting returns to homebase and so are a series of several phrases.

GESTICULATION CODING

NISA coding involves judgment of the number and length of gesticulation phrases as well as the relative complexity and character of the gesticulations in terms of laterality, upper limb unit(s) involved, intensity/quality, and spatial complexity. It is influenced by Laban Movement Analysis (Bartenieff with Lewis, 1980) and coding methods related to it such as Choreometrics (Lomax, Bartenieff & Paulay, 1968). A balance is sought between continuous recording that does not artificially break the behavioral stream and time segmenting that facilitates quantitative analysis. For positions, the unit interval is "naturalistic" because it is determined by position onset time. This is feasible because in reality there are not many position shifts in a typical session and what shifts there are can be quickly coded. However, when there are long strings of gesticulating, it is prohibitive to describe each phrase in the way a movement notation expert records details of every moment for a recording of the entire event. One solution is to impose short, fixed time units on the stream of behavior and code the most complex level reached in each of several dimensions for each unit. In NISA the gesticulations are coded in thirty-second intervals according to dimensions that will be described in detail below. Ways of "correcting" for the limitations and potential distortions that arise from artificial time segmenting are built into the method.

Coding for gesticulations is divided into two parts: number and length which together will constitute the gesticulation Density scale, and body unit, laterality, intensity/quality, and spatial complexity which will comprise the Dynamics scaling. Before coding, the researcher must decide whether the project calls for "basic" coding or "comprehensive" coding of gesticulation. "Basic coding" means that the observer will only estimate the number of gesticulation phrases per 30" and code each dimension according the highest level reached in that interval. This is the minimal information needed for states scaling and may well be enough.

The thirty second coding unit was chosen as best for discriminating intensity "states" lasting from 1/2 to several minutes. One may decide that a longer coding interval is preferred for one's project, but making it much longer than three minutes is likely to compromise observer agreement and obscure important patterns.
In "comprehensive" coding, the onset and duration of each gesticulation phrase is recorded on a "gesture line" at the top of the coding sheet and the gesture phrases per interval are labeled a, b, c, etc. Then each phrase is described according to each of the dimensions of the coding sheet. This is done by writing the letter identifiers next to their respective circled codes.

Comprehensive coding stands as virtually a naturalistic recording of the gestures. It may be valuable for projects in which specific verbal content is to be compared with the characteristics of the gestures precisely accompanying it. Combined with detailed coding of Positions and Specific Actions, comprehensive coding of Gesticulations generates a great deal of information about the structure of the dialogue, turn-taking patterns, and interaction. In any project in which a microanalysis of the ongoing behavior is necessary, comprehensive coding is in order. And because it is more detailed, it facilitates examination of exactly where coders differ, making it the procedure of choice for training. However, there have to be strong reasons for doing the comprehensive coding, as it probably takes two or three times longer than basic NISA gesticulation coding.

1 GESTICULATION NUMBER
The first measure is a count of the gesticulation phrases observed. Defining the phrases according to homebase/position criteria, the observer simply counts the number within each 30-second segment, when doing basic coding, or counts the number from the gesture line that is recorded in comprehensive coding. Note that if a gesticulation continues into the next interval, it is ascribed to the interval during which most of it occurs. (If 50% of it is in one interval and 50% in the next, than it is attributed to the first interval.)

2 GESTICULATION LENGTH
The observer determines the longest gesticulation in each interval (for basic coding) or the length of each phrase for comprehensive coding. Length is not defined by time duration, but by number of changes in direction from start to end of a gesticulation phrase. Change-in-direction constitutes a minimal unit that will be called a "phase". Phases are to be distinguished from "phrases" which are the passages between positions. (In this sense each phrase is composed of one or more phases.) Special cases of the change-in-direction criteria for length are those gesticulations in which there is a series of simple-reversal movements, back and forth, or simple circular motions. In these cases, up to 2 repetitions are counted as one direction or phase, between 3 and 4 equal to two direction changes or phases, and so on in intervals of 2.

In practice, observers are not to get bogged down in actually counting each direction phase or repetition, they are to estimate them and resort to counting only if it is difficult to distinguish one level from the next in the four-degree coding defined as follows:
NISA-14

3 LATERALITY

During gesticulations the upper limb(s) may display a variety of laterality patterns. Many gesticulations are performed unilaterally by either the right or left limb. Many are performed bilaterally, each phase of the movement in exact mirror of right and left. NISA coding of laterality involves a scale of complexity from these simple types to more complex possibilities. In NISA coding the laterality pattern must be judged relative to the phrase. It is not so common to have three different laterality patterns within one phrase, while it is quite common to see individuals display gestures of the right, then left, then both hands, if they are each separate phrases. The observer circles the most complex type of laterality displayed in a time interval, in basic coding, and the laterality patterns observed in each of the phrases of the interval for comprehensive coding. Sequence variation is not coded, only whether some pattern of one, two or three types occur within the phrase as follows:

Single: right only or left only or bilateral only

Double: left and right or bilateral and right or left and bilateral

Triple: bilateral and right and left within one phrase

4 LIMB UNIT

The gesticulation can be performed with various articulations of finger, hand, forearm and whole arm. For example, the gesture may begin with a preparatory move of the whole arm, change to a forearm action, followed by the hand articulated in a series of repetitions within a sweep of the forearm, and end with a whole arm unit back to a homebase position. NISA coding of the limb unit(s) of a gesticulation is limited as follows. If basic coding is used, then the phrase containing the largest unit is selected and each articulation within this phrase is to be included in the coding. If comprehensive coding is used, then each phrase is coded as to its active articulations. However, the limb unit(s) involved in the preparatory and return to homebase phases of the gesticulation phrase are not counted in either coding unless the phrase is very short. Also, only upper limb units that are actively moved and articulated in and of themselves are to be noted. Limb units that accompany, but are not themselves actively articulated, are not included in the coding (e.g., the forearm waves, but the hand just goes passively with it, or the hand is held such that the hand and forearm are one unit). Note that if more than one unit is circled, this means that each unit within the circle is prominently articulated during the phrase. The sequence of articulations is not described.
There is one refinement of limb articulation made in the comprehensive coding. In many gestures, a unit, usually the hand, is articulated fleetingly within what is fundamentally a larger unit movement, e.g., the hand "finishes" one phase of an arm movement by dropping the hand slightly at the end of the action. In these cases the primary unit is circled and an arrow to the part displaying minimal articulation can be drawn. This refinement also applies to cases in which the proximal unit is minimally, though perceptibly, involved, e.g., the gesture is basically done by the forearm, but in some phases, there is very slight involvement of the upper arm. Circling both forearm and upper arm symbols would not accurately reflect that essentially it is a gesture of the forearm. Note that this refinement in limb unit coding is not made for basic coding, which excludes notation of fleeting or minimal involvement of proximal units. Not also that the case in which the hand assumes a definite configuration such as a pointing is not to be included in the comprehensive coding as an instance of minimal separate articulation of the hand within an arm movement.

The limb unit symbols on the coding sheet are adapted from Labanotation symbols for limb joints (Hutchinson, 1970). They read as follows:

- \( \xi \) = finger(s) articulated individually
- \( \zeta \) = hand actively gesturing with wrist articulated
- \( \chi \) = forearm actively moving with articulation at the elbow
- \( \gamma \) = whole arm active with articulation at the shoulder

In the special case of isolated shoulder shrugs that convey specific lexical meaning (such as "I don't know"), an "S" should be written next to the unit involved. A shrug is not to be coded as "whole arm" unless it actually activates the whole arm. Write parentheses around the shoulder symbol and add an S for shrug when the movement is limited to the shoulder. If the shrug is done with isolated shoulder raise plus hand rotations, palms up, the rest of the arm inactive, then circle the hand symbol, put parentheses around the shoulder symbol, draw a bow connecting them, and add an S. All of this is necessary because in subsequent scaling, whole arm activations must be scaled differently than such isolations.

5 INTENSITY/QUALITY

For coding of intensity, the "effort" or movement quality terms from Laban Movement Analysis are used: sudden, strong, direct, indirect, sustained and light. For basic NISA coding, the most complex level seen in the thirty second interval is circled. The levels are as follows:

- Level 1: none or emergent
- Level 2: sudden
- Level 3: strong and/or direct
- Level 4: light, indirect and/or sustained

0 on level 1 means "no distinct instances of the any of the six qualities are observed." For basic coding this would be circled if no clear qualities were observed in the entire interval. Comprehensive coding, as with the other dimensions, would circle this when it was relevant to a specific phrase. In comprehensive coding, however, the observer has the option to add notations to either of the additional symbols of Level 1 for phrases that display instances of "emergent" or "almost emphasized" qualities. This is a refinement that is difficult to obtain observer agreement on, but it may be useful for projects in
which very subtle monitoring of affect changes is desired. It can also be used for cases in which the observer has difficulty deciding whether a quality is definitely displayed. Observers must be conservative when coding presence of these qualities—if in doubt they should not be recorded. However, the observer may note that one or more of the qualities was seriously considered by recording it in the Level 1 space, useful information for a detailed examination of observer disagreement. Later in the states scaling stage, all entries in Level 1 will be treated as 0.

Level 2 means those 30° intervals (if basic coding) or phrases (if comprehensive coding) in which moments of suddenness are observed. Note that the movement has to display more than acceleration, it must have distinctly quick (−) moment(s). Level 3 refers to segments or phrases that involve some strong (±) or direct (−) moment(s). Again, these must be more than cramping or simply straight paths drawn in space, they must be points during which the movement has active forcefulness or impact and/or a very channeled and direct quality. Level 4 means that the segment or phrase displays one or more of the following qualities: lightness (−) which is an active, weightless quality, indirectness (±) which is a passage of meandering, multiple-direction movement, and sustained (−) movement that is more than deceleration, it is a passage of very slow movement. For basic coding, it is enough to simply record the "highest" level observed per interval. For comprehensive coding, the observer may circle each of the qualities seen per phrase. Note that, by definition, recording 0 in Level 1 precludes recording qualities in other levels for basic coding. Frequency of qualities per interval or phrase is not recorded, only presence of one or more instances.

**SPATIAL COMPLEXITY**

There are many spatial details of gesticulating that might be coded. Consider a movement that is a series of "slices" in the air with the forearm. The spatial aspect may be considered in terms of magnitude, direction, path or areas of space moved through. These details are assessed in Part 1 Movement Signature Analysis, but not in NISA process recording, which focuses on one aspect, the relative complexity of the spatial projection itself. The coding of spatial complexity involves a range from formless movements such as vague in-out changes to movements that definitely project into space in different planes to projections that have a three-dimensional, sculpting quality. This distinction is described in various ways within Laban Movement Analysis (cf Bartenieff with Lewis, 1980) and in Choreometrics (Lomax, Bartenieff & Paulay, 1968). It is defined here as follows:
Level 1 = "shape flow" only; movement that has no definite projections into space, no clear form or direction, only fluctuations in size or in and out. On the coding sheet this is the top row of double diagonal symbols. For basic coding if there is no phase within the entire interval that shows clear projection or direction, this level is noted. For comprehensive recording, the observer has the additional option of noting in level one whether—within a basically formless movement phrase—there are signs of the emergence of distinct projecting or directionality (circling the designing the phrase). This can be used when the observer has difficulty deciding if there is distinct projection into space, but does not feel it is completely without directionality.

Level 2 = only single phase(s) of directional projection per interval (if basic coding) or phrase (if comprehensive). That is, within the movement sequence, only single, isolated phases have directionality or the quality of projecting into space, and are preceded and followed by vague forms. Comprehensive coding involves specifying further whether these single phases are performed in straight (—) or curved (—弯曲) paths and/or whether there are phases of distinct direction that are repeated, the movement reversing back on itself (—弯曲—弯曲).

Level 3 = double phases of directional projection, either one direction followed immediately by a different direction (—弯曲—弯曲) or one direction that is reversed on itself, then followed immediately by another directional projection. The third possibility at this level would be diagonal movements reversing back on themselves (—弯曲—弯曲弯曲).

Level 4 = three changes in direction without losing the spatial clarity and projection and/or at least one phase of three-dimensional sculpting/shaping. In comprehensive coding, the observer can discriminate further whether the transitions from one direction to the next are rounded (~弯曲) or angular (—弯曲) or include phases that are repeated (—弯曲—弯曲). Even one phase of movement can be coded as at level 4 if it is done with a sculpting, three-dimensional shaping of the body part(s) "carving" space (—弯曲弯曲).

Again, basic coding involves circling the highest level displayed within the thirty second interval. In comprehensive coding, the observer circles the highest level displayed per phrase. There are, of course, many ways to assess the spatial complexity of movement. The advantage of this method is that potentially any level of spatial complexity as defined here may occur—even in very short movements. Also, while most movements display some sequence of changes in direction, the criteria here is very strict—two or three changes in distinct projection exactly following each other without vague transitions. This is in reality a rather rigorous criteria, as most movement involves phases of one direction reversed on itself, or a direction emphasized then a vague phase or return to homebase followed by another direction in a different plane, etc. Like the other NISA gesticulation coding distinctions, spatial complexity is not defined by frequency and can be applied even to very short phrases. It is a nominal coding of the complexity level of phrases of any length, and as such is a deceptively powerful descriptor.

7 GESTICULATION PATTERNS

This category is used only in comprehensive coding. It is actually closest to what is most commonly recognized in a gesticulation—what is done and by what part. There is latitude as to how elaborate to make this section. The observer may simply describe each phrase in terms of gesture type and hand configuration. Or s/he may note type and configuration plus whether there are pauses in the air and moments in which the movement is very small or very large. Each phrase is described in commonly used action terms. For example, points finger and slices the air with forearm. Distinctions first made by Elson (1940) may be used here for precision (See also Part 1 Movement Signature Analysis for definition of gesticulation types):
I—Tossing, waving, or flipping of the hand or hand and arm
II—Indicators or movements that designate the location of a person or place in the immediate space.
III—Batons or movements that go with the emphasis and "beat" of the speech.
IV—Physiographs or movements that describe specific actions, objects or spatial relationships.
V—Video-elaboration or movements that primarily follow the line of thought and its changes.

These descriptors are applied to each phrase of the interval and there may well be blends or sequences of one or more types within the phrase. Also to be noted are instances in which the hand assumes a distinct configuration for two seconds or more—pointing, making a fist, cupping the hand, etc. If the hand(s) are held flat, the direction the palms "face" is useful to record. If the person uses an unusual hand configuration, it must be carefully described and given a special label, otherwise vernacular terms are used. If the project warrants such detail, the observer may add descriptions of the size of the movement (extremes of very small and very large would be plenty) and occurrences of pauses in the air during the gesticulation.

In effect, each phrase is described in verbs and nouns in such a way that the reader may be able to visualize the gesticulation sequence. In contrast, a reader would probably have great difficulty visualizing the gesticulation by reading only the NISA coding itself, as this deals with qualitative and structural details irrespective of "what" is done.

GESTICULATION STATES SCALING

Once the detailed coding is complete, the observer (or researcher or a trained research assistant) transforms the codes into scales. As explained before, the basic coding is all that is needed for states scaling. If comprehensive coding is done on each phrase per 30" interval, then scaling is based only on the "highest level" recorded per interval.

The greater detail of the comprehensive coding is to be used for more refined analyses. For example, if the researcher needs a finer-grained scale than the 1-4 scales of the basic coding, he or she can construct one from the comprehensive coding using operational criteria of highest level reached plus degree of variation within and between levels. Or the greater detail can be used for microanalysis of ongoing behaviors such as specific speech/motion correlations. The many potentials for measurement and process analysis of the comprehensive coding can only be suggested here. Practically speaking, however, it is more likely to be of use in single-session studies for discovery of patterns that can then be tracked in a "grosser", less time-consuming way.

Initial research (Davis & Hadiks, 1987, 1990, in preparation) indicates that scaling the basic gesticulation coding is valuable for study of affect changes. The following are criteria for scaling the basic gesticulation coding. Scale scores are computed for each "30" interval in which some speech gesticulation is seen.

1 GESTICULATION DENSITY

The "amount" of gesticulating is a composite of number of gesticulation phrases and greatest length of phrase per interval. (Remember phrases that "run over" from one time unit to the next are assigned to the unit in which they primarily occur—or first occur, if there is a 50-50 distribution.) The "Density" is scaled as follows:
GESTURE DENSITY CRITERION

<table>
<thead>
<tr>
<th>Number of gesticulation phrases</th>
<th>Highest Gesticulation length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 LOW</td>
<td>1 or 2</td>
</tr>
<tr>
<td>2 MEDIUM LOW</td>
<td>1 or 2</td>
</tr>
<tr>
<td>Low</td>
<td>3 or 4</td>
</tr>
<tr>
<td>3 MEDIUM HIGH</td>
<td>1 or 2</td>
</tr>
<tr>
<td>High</td>
<td>3 or 4</td>
</tr>
<tr>
<td>4</td>
<td>5 or 6</td>
</tr>
<tr>
<td></td>
<td>3 or 4</td>
</tr>
</tbody>
</table>

2 GESTICULATION DYNAMICS

Codes from the other four categories of gesticulation coding—laterality, limb unit, intensity/quality, and spatial complexity—are combined to create a scale from lowest to highest gesticulation "Dynamics". In this model, one may gesticulate "a lot" (high Density) but not display great intensity or complexity (low Dynamics). Of course, for many subjects, the more frequent the gesticulating, the more likely it will become complex and intense (Davis & Haiks, 1991), but the exceptions are clinically important in this method, i.e., low Density/high Dynamics or high Density/low Dynamics. Therefore, the two scales must be examined in relation to each other. The chart on the following page lists criteria for transposing the scores for laterality, limb unit, intensity/quality and spatial complexity into Gesticulation Dynamics scaling recorded per 30° interval. An example of Gesticulation coding and scaling is presented at the end of the NISA section.

* Note that in the Dynamics scaling criteria, Spatial Complexity codes are effectively collapse into low (1 or 2) and high (3 or 4) and intensity codes of 3 and 4 are effectively equivalent. This raises the question as to why these codes aren't simplified from the beginning. The coding itself is not simplified because observer training and reliability is facilitated by these distinctions and because operationally, they are important differentiations that may in future research prove valuable. It is too early to collapse them and treat them as if they are equivalent.
GESTICULATION DYNAMICS SCALING

Level 1: LOW-BASELINE
-Laterality simplest--1
-Small Limb Units--1/2/3
-No intensity/quality--1
-Low Spatial Complexity--1/2

Level 2: MEDIUM LOW-EMERGENT
-Laterality 1--Limb Unit 1/2/3--Intensity 3/4--Spatial Complexity 1/2
-Laterality 3--Limb Unit 1/2/3--Intensity 1/2--Spatial Complexity 1/2

Choose 1 or 2 of following, remainder lower:
- Laterality 2--Limb Unit 4--Intensity 2--Spatial Complexity 3/4

Level 3: MEDIUM HIGH
-Laterality 2--Limb Unit 4--Intensity 3--Spatial Complexity 1/2
- Laterality 2--Limb Unit 1/2/3--Intensity 3/4--Spatial Complexity 3/4
- Laterality 3--Limb Unit 4--Intensity 1/2--Spatial Complexity 1/2

Choose 3 or 4 of following, remainder lower:
- Laterality 2--Limb Unit 4--Intensity 2--Spatial Complexity 3,4

Intensity 3/4 PLUS:
- Laterality 2 or Limb Unit 4 or Spatial Complexity 3/4 (remainders lower)

Level 3 PLUS:
- Limb Unit 4 or Intensity 3/4 or Spatial Complexity 3/4 (remainders lower)

Level 4: HIGH
- Laterality 3--Limb Unit 4--Intensity 2--Spatial Complexity 3/4
- Laterality 3--Limb Unit 1/2/3--Intensity 3/4--Spatial Complexity 3/4
- Laterality 1/2--Limb Unit 4--Intensity 3/4--Spatial Complexity 3/4
- Laterality 3--Limb Unit 4--Intensity 3/4--Spatial Complexity 1/2
- Laterality 3--Limb Unit 4--Intensity 3/4--Spatial Complexity 3/4
SPECIFIC ACTIONS

In addition to the myriad positions and gesticulations that may be displayed by someone in conversation, there may be discrete actions that are valuable for studies of defensive processes and changes in level of affective involvement. The term "specific actions" refers to "what" is done (in contrast to the descriptions of "how" the person gesticulates or changes position), e.g. rubs chin, smooths hair, taps foot. In addition to these recognizable actions that can be described in ordinary action terms, this coding section includes patterns that require special training to identify.

As with Position and Gesticulation coding, the researcher must decide whether to have observers do basic or comprehensive coding, depending on the needs of a given project. For certain items, the distinction is largely one of how detailed to make the recording of onset and duration of the actions. However, the researcher must also decide whether to add certain codes and refinements. As with gesticulations and positions, the basic coding is all that is necessary for generation of the nonverbal states scales.

"Palming"—both hands turned palm-upward and "presented" to the other—appears to be an action so specifically indicative of defensiveness that it has been pulled out of gesticulation coding and given a special place in this section. Scheflen (1973) and Beels & Ferber (1989) demonstrate that bilateral palming can be seen when one is trying to negotiate something, defend his or her actions, appeal to another in a vaguely appeasing way. Scheflen (1973) has also demonstrated the defensive function of "preening" actions such as fixing the hair or clothes. Often at first meeting, people make adjustments of tie, dress, hair, etc. During a therapy session phases of preening activity can occur even when patient and therapist have worked a long time together.

Within the variety of self-directed actions that may be displayed, certain types of self-touch and fidgeting are considered particularly salient clinically and so are the focus of NISA coding. Another set of categories in Specific Actions coding involves aspects of gaze and head movement during conversation that are hypothesized to reflect increases in distress, pressure, or inner conflict.

A category that might have been added to the Gesticulation or the Position section, but which is isolated here as its own item is the presence of postural or total body activation, irrespective of what the action is. This is placed within specific actions because, although many postural shifts accompany position shifts and some may be seen during animated gesticulation, it is arguably a special distinction of any activity that suggests heightened involvement. Isolating it for special attention allows for research on its significance relative to various "subsystems" of activity.

Finally, there is space within Specific Actions coding for tracing the incidents of special patterns identified within Movement Signature Analysis (Part 1 of this Guide). If a study project aims, note may be made of when in the interaction process certain selected "signature patterns" of the individual are displayed. For example, the therapist in one study showed a distinctive sequence of foot raise, self touch, and position shift performed as a unit that was found to correspond with the onset of his major interventions (Davis & Hadiks, 1991). Rather than trace fragments of this pattern in separate coding items, the pattern itself, identified in a Signature Analysis, can be given a label and recorded each time it occurs.

Similarly, some clients may display forms of disorganization, restriction or severe movement disturbance at certain moments. These patterns can be defined in a simple way for use in "basic coding" or drawn from the list of patterns within the Movement Psychodiagnostic Inventory (Part 2 of this Guide) for a comprehensive coding. This
would facilitate study of the relation of these symptoms to various aspects of the interaction.

There well may be other nonverbal signs of stress, conflict, anxiety, etc. that the researcher may identify. At the bottom of the Specific Actions coding sheet are blank spaces that allow the researcher to add actions not coded in other parts of NISA recording, but posited to be useful in a study of signs of stress and defensiveness.

**SPECIFIC ACTIONS CODING**

1. **BILATERAL PALMING**: This is a discrete gesture that accompanies speech. Both hands must be sufficiently open, palms facing up such that they are displayed to the other. This does not include actions in which the hand is held up with palm flat as in a 'stop' gesture. Bilateral palming within a 30" interval is sufficient. A simple check in the appropriate coding sheet space is written for this. For comprehensive coding, onset and ending times of each phrase of bilateral coding is recorded in minutes and seconds.

2. **PREENING**: Actions in which the hair or clothes are fixed or adjusted—straightening one's skirt, running fingers through one's hair, adjusting one's tie, etc. Non-contact forms may be included, such as tossing the head to rearrange the hair or exaggerated "presenting" of the chest, pelvis or legs in moves that expose or display these areas and draw attention to them. For basic coding, presence of preening actions in an interval is sufficient. For comprehensive coding, onset and ending of each action is recorded with verbal labels as to which type.

3. **BODY RUBBING**: Actions in which the person clearly rubs or wipes a surface or part of the body, including rubbing or scratching through clothing. This item may include simple motions such as a "nose-wipe" once under the nose, or repetitive actions such as rubbing eyes or scratching the arm. For basic coding, presence of rubbing actions in an interval is noted. For comprehensive coding, note is made of what is done using simple labels such as right hand nose-wipe, left hand to cheek-rub, etc. the onset time and—if it is 4 seconds or longer—the time the action stops.

4. **FIDGETING**: Repetitive body movements excluding speech-related actions (such as head nodding), functional actions (such as tamping a cigarette), or self-touching activity. Examples would include tapping the foot during listening or speaking, rubbing the arm of the chair, and slightly rocking. For basic coding, presence of fidgeting actions within an interval is noted with a checkmark. For comprehensive coding, the type, body part involved, onset and ending of each series is recorded. Also if the fidgeting is performed with some type of marked intensity such as very rapidly or very vigorously, this is noted.

5. **POSTURAL SHIFTS**: Movement that involves the entire body. Whatever the activity, there is at least one fleeting moment in which the entire body is activated even if there is not much displacement in space. For example, one may begin a position shift with a lean of the trunk that spreads to the arm followed by one moment in which the legs, trunk and arms all become activated before just the legs are crossed. Or one may gesticulate and at one point become so animated that the gesticulation is supported by a total body activation. For basic coding only occurrence of postural shift(s) is recorded per interval. For comprehensive coding, the onset and number of phases (changes in direction) that are postural is recorded plus note of what type of activity the postural movement is a part of, i.e., position shift, gesturing, instrumental activity, fidgeting, etc.
6 EYEBLINK RATE: For basic coding, the observer is to judge whether a given interval has at least one period of very rapid blinking (short "bursts" such as double blinks in less than half a second or 3 in one second as well as rapid periods such as 10 per five seconds, 15 per ten seconds, 50+ per 30 seconds) or unusually long periods with no blinking (e.g. no blinking for 20 seconds or more). A notation of Ra or No per interval is sufficient for basic coding. For comprehensive coding, the actual number of eyeblinks per interval may be entered, but it is probably more useful to record onset time of each Ra or No passage according to the criteria described above for the basic coding. Also, if it can be determined on preliminary examination that the periods of very rapid or no blinking are associated with certain behaviors or contexts (e.g. rapid only when listening), the researcher may advise coders to add information on what activity the rapid period is accompanying.

7 GAZE DIRECTION ONLY: When a person shifts his or her gaze direction during interactions, it is usually accompanied by at least a slight head movement in the same direction. An operational definition of "shifty-eyed" is looking at a specific object or person in the room (excluding points high above the interactants or down in front of the speaker) without moving the head that way as well. This can be done two ways: eyes leading (e-l) = distinct shift of eyes, pause, then the head follows eyes shift only (e-o) = two or more gaze shifts without head moves that "join" them.

(Do not count glances up to ceiling or down toward floor.)

For basic coding a check mark in the appropriate 30" interval on the coding sheet indicates the coder has observed at least one incidence of gaze direction unaccompanied by head moves in the same direction. For comprehensive coding, the researcher may wish to record type (e-l, e-o), target (what or who is looked at this way), and onset time for each incidence within the interval. Of course, it is very possible this pattern will not be displayed.

8-10 SPECIAL PATTERNS: This is an option for comprehensive coding. The researcher may select certain "signature patterns" from a Movement Signature Analysis of the individual (see Part 1), define and label them for the observer, and the session may be scanned for the occurrence of these patterns. For example, if the researcher has identified certain movement patterns that appear to be the individual's distinctive way of indicating stress or conflict, then these could be listed in the blank rows 8 through 10 and tracked over the session in terms of onset time. Note that these patterns are subtle; this is not the space for severe or serious motor constriction or pathology such as is indentified in the Movement Psychodiagnostic Inventory (Part 2). One need not do a Movement Signature Analysis to identify these patterns, although this would be the most rigorous way. This is the space for any distinctive patterns that the researcher identifies during preliminary study.

11 MOVEMENT PATHOLOGY: If it is considered possible for the subject to display patterns of motor pathology such as disorganization or severe restriction, this is the space in which the specific patterns can be tracked. For example, if the research involves study of symptom expression in relation to the interaction process, this could be a valuable addition. Note that only very disturbed or extreme patterns are to be coded here. If certain patterns have been identified through a Movement Psychodiagnostic Inventory (see Part 2 of Guide) for the individual, then the number designating each with onset time can be recorded in the appropriate interval as part of a comprehensive coding.
Additional Coding Notes:
Just as for Positions and Gesticulations, the observer is encouraged to note when something in the Specific Actions coding is difficult to determine. The rule to be conservative and record only clear and unequivocally observed patterns holds for this section as well. Patterns "almost" coded can be identified by parentheses and the letter A. Codes in parentheses will not be counted in the subsequent scaling. However, they may prove useful for assessment of observer agreement because they identify where coders have trouble. They may also be useful as cues to patterns deserving further investigation.

When ascribing actions to fixed time intervals, the same rule applies as for gesticulations. If an action starts in one interval and finishes in the next, it is assigned to the interval in which it primarily occurs. If evenly divided between intervals, it is ascribed to the first unit.

As can be seen, one either does the basic coding of items 1 through 7 in terms of presence or absence per interval or one opts to do some range of the comprehensive coding that may include items 8 through 11 and requires considerably more observation training and coding time. The basic coding is sufficient for states scaling that will be described in the next session. Of course, greater detail in coding is useful for evaluating and obtaining observer agreement—the closer the coding is to visible behavior and the lower the level of inference required, the easier it is to learn and observe agreement. Whether comprehensive coding is warranted for a given research project depends on the resources and goals of the project.

Most of the items of Specific Action coding are defined in such a way as to be useful for study of physical manifestations of stress, conflict, or anxiety during the interaction. More accurately, the behaviors defined here may be regarded as motor manifestations of defensiveness from which increases in psychological stress and conflict are inferred. The basic coding generates scales that are probably finer tuned than many measures of stress in interaction. The comprehensive coding can be tailored to yield even subtle and more complex measures of defensiveness useful for more microanalytic studies and correlation with physiological measures.

Specific Action Relationships
As discussed in the Position section, there are moments during the interaction when relationships between the participants' actions are striking. NISA coding and states analysis is essentially contructed so that relationships between the subjects' behaviors can be analyzed from the recordings of each subject. For example, correspondences between actions can be identified by lining up the recordings of the participants for a visual scan, while subtle patterns of convergence and co-variation—not obvious to the eye—can be detected from quantitative analysis of the scaled scores. However, for certain projects, it may be desirable to code and scale observations of relationships between actions directly. The most obvious cases would be moments in which actions of each are exactly synchronized. An observer can easily perceive such moments from videotape played back at regular speed. But to do this s/he must view both subjects together. If it is preferable for coders to view only one subject at a time, then all NISA coding should be completed per individual before coders see both interactants at once. The following categories and symbols were also listed in Position coding:

- = synchronous change (indicate whether at onset of action or change of direction, peak, or completion of action)
\[\rightarrow\] = echoing (one action followed within 3' by same action of other)
\[\rightarrow\] \[\rightarrow\] = mirroring of actions, right with left
\[\rightarrow\] \[\rightarrow\] = identical actions, e.g. on right side of one subject matching right of other
Generally speaking, such convergences have been regarded as a sign of support or efforts to build rapport (cf. Charny, 1966; Scheflen, 1973; Davis, 1985), but of course, this could well depend on the type of behavior matched. This information is available if the observer records the coordination symbol next to the specific action that is matched. Scaling the degree to which the pair display specific signs of coordination and matching can easily be done from records of the presence of synchrony, echoing, mirroring or identical-side actions per thirty second intervals (0 = none, 1 = one type observed, 2 = more than two types per 30°).

SPECIFIC ACTION SCALING

The basic coding of Specific Actions involves recording only presence or absence of a pattern per 30° unit. Frequency and length within the interval are not noted, although presence of the same pattern in each of several consecutive units would constitute something of an "outbreak" of what are usually relatively rare actions. The following are rules for combining codes per 30° into several three-point scales:

1. Defensive Social Actions Scale
   0 = no incidents of preening or bilateral palming
   1 = presence of either preening or bilateral palming
   2 = presence of both preening and bilateral palming

2. Self-Related Actions Scale
   0 = no incidents of self-touch or fidgetting
   1 = presence of either self-touch or repetitive fidgetting
   2 = presence of both self-touch and repetitive fidgetting

3. Gaze Stress Scale
   0 = no incidents of rapid or stopped blinking or isolated eye shifts
   1 = presence of either blinking extremes or shifty-eyed patterns
   2 = presence of blinking extremes and shifty-eyed pattern

The above scales are derived from basic coding of items 1-4, 6 and 7 of Specific Actions coding. Items 5, Postural shifts, is to be used by itself on the final states recording sheets like an exclamation mark intensifying whatever point at which it occurs. Items 8 through 11 are part of comprehensive coding and require more highly trained coders, so they are only likely to be included in special projects such as studies of psychiatric in-patients. If they are obtained, the following 3-point scale combines them.

4. Special Movement Stress Scale
   0 = no patterns as defined by a Movement Signature Analysis of distinctive patterns indicating stress, constriction, or anxiety and no patterns defined in the Movement Psychodiagnostic Inventory
   1 = presence of stress pattern from Movement Signature Analysis or level 1 (less serious, non-psychotic) signs of movement disturbance from the Movement Psychodiagnostic Inventory
   2 = presence of one or more level 2 (serious pathology, associated with psychosis) movement patterns from the Movement Psychodiagnostic Inventory
References

Part 3 NISA


**BASE POSITION**

**NISA POSITION CODING**

<table>
<thead>
<tr>
<th>Shift</th>
<th>Context</th>
<th>Coder</th>
<th>Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NISA EXAMPLE**

Next position change after 60s: a + 63.3°. Symmetry is slightly off.

At 60s, "a + 63.3°" he raises head up and back and holds this for 11°.

* Back in type, somewhere?"
## NISA Gesticulation Coding

<table>
<thead>
<tr>
<th>Subject</th>
<th>Context</th>
<th>Coder</th>
<th>Segment</th>
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</thead>
</table>

### NISA Example

<table>
<thead>
<tr>
<th>Time</th>
<th>Length</th>
<th>Laterality</th>
<th>Line Unit</th>
<th>Intensity</th>
<th>Spatial Complexity</th>
<th>Pattern</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- VS: Vertical Spacing
- EX: Exaggeration
- BL: Bilateral
- R/B: Right/Both
- L/R: Left/Right
- B/L: Both/Left
- L/B: Left/Both
- T/R: Thumb/Right
- T/L: Thumb/Left
- E: Elbow
- F: Finger
- H: Hand
- A: Arm
- L: Leg
- C: Change
- P: Premise
- D: Duration
- Q: Quality
- M: Motion
- T: Timing
- S: Speed
- R: Repeat
- I: Intensity
- P: Pattern

### Description of Hand Gestures

- ![Gesture Diagram](image)
- ![Gesture Diagram](image)
- ![Gesture Diagram](image)
- ![Gesture Diagram](image)
- ![Gesture Diagram](image)

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- **Pattern Description:**
  - (a) Index finger with cupped hand; thumb to man at right, point at viewer; in rolled hand move back and forth to visual areas.
  - (b) Vertical spacing; motions paused in air; extended arm in and out with some beat; pattern followed by quick pull forward then to self and forward in air.
  - (c) Vertical spacing; motions paused in air; extended arm in and out with some beat; pattern followed by quick pull forward then to self and forward in air.
  - (d) Extended arm in and out with some beat; pattern followed by quick pull forward then to self and forward in air.
  - (e) Extended arm in and out with some beat; pattern followed by quick pull forward then to self and forward in air.
  - (f) Extended arm in and out with some beat; pattern followed by quick pull forward then to self and forward in air.

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- **Contextual Notes:**
  - B: Bilateral
  - L: Left
  - R: Right
  - U: Up
  - D: Down
  - F: Forward
  - B: Back
  - S: Static
  - M: Motion
  - P: Premise
  - D: Duration
  - Q: Quality
  - M: Motion
  - T: Timing
  - S: Speed
  - R: Repeat
  - I: Intensity
  - P: Pattern

---

- **Spatial Relations:**
  - ![Spatial Diagram](image)
  - ![Spatial Diagram](image)
  - ![Spatial Diagram](image)
  - ![Spatial Diagram](image)
  - ![Spatial Diagram](image)

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- **Coding Example:**
  - Subject: S
  - Context: H
  - Coder: MD
  - Segment: 62:30

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- **Visual Representation:**
  - ![Visual Representation](image)
  - ![Visual Representation](image)
**NISA Example**

<table>
<thead>
<tr>
<th>NISA States Scales</th>
<th>Subject</th>
<th>Context</th>
<th>Coder</th>
<th>Segment</th>
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<tr>
<td>Line 1</td>
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<td>1</td>
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<td>speech time records</td>
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<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Legend**
- **3**: High
- **2**: Moderate
- **1**: Low
- **0**: None