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COMPARISONS OF BODY ACTIVITY IN DEPRESSED,
MANIC, AND NORMAL PERSONS

by

Bron B. Ingoldsby

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Family and Human Development

ACKNOWLEDGMENTS

Dedicated to my major professor, Dr. Craig Peery, who got me into this mess;

And to my wife, Valerie, who helped me out.

A handwritten signature in cursive script, reading "Bron B. Ingoldsby". The signature is written in dark ink and includes a stylized flourish at the end.

Bron B. Ingoldsby

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ABSTRACT

Comparisons of Body Activity in Depressed,
Manic, and Normal Persons

by

Bron B. Ingoldsby, Master of Science

Utah State University, 1976

Major Professor: Dr. Craig Peery
Department: Family and Human Development

Films of three depressed persons, one manic, and one normal individual were analyzed frame-by-frame to determine body activity rates. Speech rates were also determined. It was found that the manic had the highest activity rate, followed by the normal comparison, and with the depressed patients having the lowest activity rates. The depressed subjects also had lower speech rates than did the normal or the manic subjects. The term 'psychomotor retardation' is called into question, as the frequency distributions of movement durations were similar for all subjects. Implications for treatment and for development are also discussed.

(55 pages)

INTRODUCTION

Recent literature on nonverbal communication has stressed the importance of nonverbal cues in therapeutic interaction. Indeed, many clinicians use nonverbal cues to help them make a diagnosis. It is widely believed in the psychological community that depressed persons tend to move and speak more slowly than do normal individuals; and the opposite is considered to be true for manics. However, these assumptions have never been systematically verified. With the importance of nonverbal communication in clinical work being increasingly recognized, such verification is needed. This is an exploratory study to investigate the relationship between emotional state and body activity rate. The body activity of depressed, manic, and normal individuals are compared.

Nonverbal communication

In addition to the use of language, man communicates with others in a variety of nonverbal ways. Tone of voice can give different meanings to the content of speech. One's appearance can be very informative. Wood (1976) defines body language as "any reflexive or nonreflexive movement or position use to communicate an emotional, attitudinal, or informational message to someone else" (p. 184). A wink, smile, or fidgeting can tell us much about a person. Beier (1966) tells us that

these nonverbal messages can be unconscious as well as conscious.

It is the communication of emotional state that is the focus of this study. It has been a popular theory that emotions are expressed through nonverbal behavior (Ekman & Friesen, 1967); in fact, Brengelmann (1961) in his review of expressive movements revealed literature connecting personality and abnormal behavior to gait, gestures, posture, facial expression, judgment of expression, voice, speech, language, art and drawings, and handwriting. However, the question of how the interpretation of emotion by the observer might be related to the type of nonverbal cue observed has been mostly restricted to the components of facial expression, and there have been few attempts to measure directly how body movements or facial expressions vary under different emotional conditions.

In fact, Duncan (1969) in his review of the work that has been done in the field of nonverbal communication, pointed out that: "It was not until the 1950's that studies began to appear reporting systematic efforts to transcribe gestures and other non-language (or nonverbal) behaviors, and to understand the culturally prescribed codes that moderate their use and significance in human communication" (p. 118).

That noncontent cues can communicate emotion has been substantiated by a number of studies. Beier & Zautro (1972) had audiotapes of noncontent phrases intended to express six different emotions judged. The result was that the nonverbal vocal channel of communication can be used to express emotion even to members of different cultures.

Burns and Beier (1973) made films where college students depicted eight moods which were judged by other volunteers. The outcome was that visual cues appear to be more influential as well as more accurate in their designation of mood state than either verbal or nonverbal vocal cues.

Ekman (1965) compared head and body cues, and found that they provide differential information about apparent emotion to an observer. The observer's impressions from inspecting still photographs were that the head is more informative about the nature of the emotion, while the body is more informative about the intensity of the emotion.

Ekman and Friesen (1968) found that reliable agreements can be obtained among observers of body motion, and that body motion provides

information about affect, the ongoing interpersonal relationship, and psycho-dynamics and ego defenses, and that there are complex interrelationships between nonverbal behavior and content or noncontent aspects of speech. (p. 213)

Family interaction and personality development

The nonverbal communication of emotion is very important when related to human interaction and development. Beier (1966) points out that children learn nonverbal cues from their parents and others at a very early age. For instance, a young child may unconsciously realize that he is upset when mom is nervous and at ease when she is calm. Most of these messages have the purpose of influencing the

respondant--to get the person with whom one is interacting to respond in a certain way, which serves to reinforce the individuals' way of acting.

Such concepts are supported by many family therapists who have investigated pathological interaction. Haley (1971) and Jackson & Weakland (1961) speak of family homeostasis, which means that there is a certain psychological climate in a family and that attempted deviations from that state by any member is resisted by the others.

Therapy is provided by breaking up the pathological patterns that exist within a family. These patterns reinforce themselves nonverbally, and are passed on from parent to child. Part of the personality that a child grows up with are the emotional states that he has learned from significant others. This all takes on new understanding when the behavioral correlates of psychopathological states are investigated.

Behavioral correlates of psychological state

Sainsbury (1955) used an electromyograph to measure arm movements and found that significantly more movements occurred during stressful parts of an interview than during neutral portions. Dittman (1962) followed this up by counting the frequency of movements in three body areas (head, hands, and legs) for one patient in each of five different moods. A filmed interview of the patient was used, in which judges agreed that the subject manifested by his verbal content being in the specified mood categories.

Dittman found that moods were differentiated by frequency of movement, and also that different body areas were active for different moods. In total movements, the mood of 'jittery' had the most, followed by 'calm' and 'angry', with 'hurt' and 'gloomy' (depressed) having the least movements

Brown et. al. , (1973) did a study in which he played voices speaking at different rates and had them judged for different characteristics. The faster speakers were judged to be less benevolent and more competent, while the slower speakers were judged as less competent.

Anxiety is an example of a psychological state that has been associated with some types of activity rates. Borkovec (1974) associated increased heartbeat with anxiety. Speech disturbances also increase during periods of anxiety (Marcos, 1973). The Hopkins Symptom Checklist (Derogatis, et. al. , 1974) includes the following terms in its definition of anxiety: restlessness, nervousness, trembling, shakiness inside, and heart pounding or racing. The Bendig Manifest Anxiety subscale of the Minnesota Multiphasic Personality Inventory (Rodda, et. al. , 1971) has these statements as indications of anxiety: "I am always in a hurry", "I feel I am always trying to meet deadlines", and "I feel like I am pushing myself all the time to get things done in a hurry".

Mania and depression

The Psychiatric Dictionary (1970) contains this definition of mania as it relates to activity:

The manic form of manic depressive psychosis is characterized by (a) an elated or euphoric, although unstable, mood; (b) increased psychomotor activity, restlessness, agitation, etc.; and (c) increase in number of ideas and speed of thinking and speaking, which in more severe forms proceed to flight of ideas, often with a grandiose trend. (p. 445).

The expression psycho-motor overactivity refers to physical overactivity. In extreme states it is incessant throughout the waking hours; the patient attempts to motorize, that is, to put into physical execution all the ideas that occur to him; this tendency, therefore, leads to a shifting of physical activity paralleling that in the mental sphere (p. 446).

In partially defining depression, the Psychiatric Dictionary (1970) says the following:

A clinical syndrome consisting of lowering of mood-tone, difficulty in thinking, and psychomotor retardation. . . a diminution of mental, psychomotor, and even organic activity. . . (p. 200, emphasis added).

The dictionary later defines 'psychomotor' as "movement that is psychially determined (not) organic in cause" (p. 616).

Fromme (1972) indentifies slower movement with sorrow, and Marcos (1973) associates slow speech and increased silence with depression. The Welsh Pure Depression subscale of the Minnesota Multiphasic Personality Inventory (Rodda, et al., 1971) includes these items as evidence of depression: "I get tired for no reason" and "I just don't seem to have the energy to do things."

Waser (1974) had senior psychology undergraduates, final-year counseling undergraduates, counseling graduates, and clinical faculty

members watch a silent video-tape of five depressed and five nondepressed psychiatric patients. The raters were asked to identify depressed patients on the basis of nonverbal cues alone. The counseling graduates identified depression best and the psychology undergraduates were the least accurate. When it is taken into account that the faculty spend most of their time in activities other than therapy, a case can be made that with increasing experience one informally learns to read nonverbal cues. In Waxer's study the most salient cues for depression were less eye contact and a down-in-the-mouth appearance, with the head angled downward.

Activity regulation

There is evidence that one's speech and motor activity is not random, but regulated. Jaffe (1964) found that people have regular speech patterns that they characteristically use when talking. Condon and Ogston (1966) found harmonious or synchronous organizations of change between body motion and speech in both intra-individual and interactional behavior. However, this "self synchrony" is partially disrupted with some "non-normals" like schizophrenics.

Condon & Sander (1974) and Peery (1976) have used frame-by-frame film analysis to find evidence of motor interactional synchrony in neonates. Stern (1971) and Peery (1976) have found a high degree of coordination between approach and withdrawal behavior in infants; as the adult would approach, the child would withdraw, and visa versa.

Peery (1976) has also found that speech is not necessary for the existence of interactional synchrony.

From these findings, a number of possible implications emerge. First, children are attending closely to the actions of others from a very early age. Secondly, people have certain patterns of speech and action. It is possible that activity rate is a variable within these patterns that can be affected by emotional state. If so, then it may be that a parent can communicate his emotional state to a child by way of his activity level. Adopting this body activity, the child would also be in part adopting the emotional state that goes with it.

Conclusions

In summary, the following basic concepts have emerged: First, activity rates for speech and body movements are believed to correlate with certain psychological states, including mania and depression. Secondly, most studied relationships between psychological state and body activity are inferential and intuitive; systematic studies to determine these relationships have not yet been undertaken. Finally, such a relationship, if established, could have far reaching effects in the areas of psychodiagnosis, family interaction and development, and therapy.

In short, a gap exists between the nonverbal studies that have been done and certain assumptions related to them. Mania and depression are major emotional states about which assumptions concerning

activity rate already exist, and these assumptions need to be examined.

Isolating and identifying nonverbal characteristics of specific emotional states can create valuable tools for patient diagnosis and treatment, as well as contributing to understanding in the areas of human interaction and development.

Subjects were selected for this study which clearly represent specific diagnostic categories. By means of a precise counting method, the following has been investigated: 1) The activity levels of manic, depressed, and normal persons; 2) whether or not the activity rate of one person is influenced by that of another when they are interacting; and 3) the degree of consistency that one exhibits in his speech and actions.

METHOD

Data collection

The best method of data collection for this type of study is film because it is not compromised by interpretation--as are report methods--and it can be slowed down and reviewed to pick up movements that might be missed in vivo. Frame-by-frame analysis reveals the micro-movements of the individual. Stern, Peery, and Condon (include ref. years) have all used this method successfully. Waxer (1974b) studied films of depressed persons for nonverbal cues of their condition, but he took note of eye contact rather than activity rate.

In order to insure validity we sought films that had been produced to demonstrate different psychological states using actual patients. After a thorough search we selected the only set that met our criteria.

The National Film Board of Canada has developed a Mental Symptoms series of motion picture films that are described by the Film Board as follows:

Produced for the Department of National Health and Welfare, these films present demonstrations of some manifestations of various mental disorders.

The films are restricted for screening only to audiences with a professional interest in the field of mental health or related fields; they are not to be shown to general audiences or to satisfy casual interest in mental illness.

In each film a psychiatrist describes the type of mental disorder to be illustrated. An interview between the patient(s) and the psychiatrist follows, in which typical symptoms of the disorder are demonstrated.

We selected three films which are described as follows: Depressive States: I; shows some manifestations of the agitated form of severe depression. Depressive States: II; shows manifestations of the retarded form of depression and depicts a severe depression which has reached the point of attempted suicide. Manic State; shows manifestations of the manic state.

Each film lasts between ten and thirteen minutes. They begin with an introduction by a psychiatrist, who describes the symptoms of the patient about to be seen. The remainder is an interview between doctor and patient, in which they are both sitting down.

Even these films which were made as demonstrations follow standard biases by emphasizing verbal content rather than any non-verbal cues. Each film only shows the subjects from the shoulders up, however, as Ekman (1965) found, the head is the body area most expressive of the nature of emotion. Had we made our own films there would have been the problems of finding patients and getting clinical consensus as to their psychological state.

Only those body movements that the films allowed the viewer to see in all the subjects were recorded. As the patients were only shown from the shoulders up, movements of the following body parts only were recorded: head, torso, mouth, and eye blinks. The entire bodies

of the retarded depressed and the manic patients, along with that of the doctor, were shown briefly as they walked on camera and sat down together. Ten seconds each of those two entrances were scored, recording the movements of the head, torso, both arms, and both legs.

Each movement (start, stop, or change of direction) was recorded for each frame (see Appendix A for example of data sheet). The columns represent the body parts and the rows represent the frame numbers. Arrows were drawn through the frame squares to indicate when an action for that particular body part began and ended.

Speech rates were obtained by making audio-tape recordings of the three introductory speeches by the psychiatrist and thirty seconds of conversation between the doctor and each patient.

Subjects

The films provided us with a sample of five subjects: the psychiatrist, who serves as the normal comparison; a manic lady; and three depressed persons. One lady suffers from retarded depression, another from suicidal depression, and a man suffers from agitated depression. There are two interviews with the agitated patient, one in the evening, when he is relatively calm, and the other the next morning, when he is very agitated. He experiences diurnal fluctuations, being more depressed and agitated in the mornings and feeling better in the evenings.

Scoring

The films were viewed on a Projectola 16mm Professional Viewer, model LB 1600, which shows the film on a small screen; an Einzelbilder frame counter was used to indicate frame numbers. With the use of a hand-operated movie editor, this system allows for repeated back and forth viewing of precise segments of behavior frame-by-frame or several frames in sequence. The films are exposed at twenty-four frames per second.

One thirty-second segment for each subject was selected at random from the films for scoring. Two thirty second segments for the agitated depressed subject were analyzed; one from the evening interview, when he was more calm, and one from the morning interview when he was more agitated. Unlike the others, the psychiatrist's segment is not continuous, but is a composite of three ten-second segments, one taken from each of the three film introductions, where he is speaking alone. This was to check for consistency in the doctor across the time span of the making of the three films.

Thirty seconds is actually 720 frames. As will be shown later, an average movement only takes about five or six frames, and with four or five body parts in motion at one time, a subject can make hundreds of movements in thirty seconds--sufficient to demonstrate whatever type of activity one is engaged in. One continuous segment of behavior was analyzed for each patient, rather than a series of disconnected segments so that if any patterns or sequences of behavior emerged, as

some did, these could be noted and analyzed.

Data analysis

The data were analyzed in the following ways: 1) Activity rate-- the total number of starts, changes, and stops in the movements of all the listed body parts of each subject was counted. These were compared between subjects by the use of graphs, totals, and means. 2) For analysis of the above rates within subjects to determine consistency of movements, the chi-square test was used. Each test had one row, with the movement totals per two seconds comprising the cells. The overall mean for each subject was used as the expected value for each cell. 3) Speech rate was determined by calculating a syllables per second. 4) A pearson Product Moment Correlation was used to check for correlations of body activity between the doctor and the two patients when they are shown together. 5) Frequency distributions of movement durations were constructed to compare profiles across subjects. 6) Finally, what are referred to as "quantal units" (see Condon & Sander, 1974) were counted. A quantal unit is the duration between simultaneous starts, stops, and/or changes in direction between two or more body parts, plus or minus one frame. For instance, a head, torso, and mouth movement might all begin at the same frame, and end at the same frame as well. This whole block of action is counted as one unit, rather than as three starts and three stops as it would be in counting body activity. As it is possible to

increase one's activity rate simply by moving more body parts than someone else, it was felt that it might be useful to have a gauge for activity with the differing number of possible moving body parts equalized. (see Appendix A for examples of quantal units.)

Intra-rater reliability

An intra-rater reliability check was taken to verify the accuracy of the original film scoring. A five-second section was randomly selected from the thirty-second segment that had previously been scored for one of the patients. Reliability as to the total number of body movements was 98%. As to duration of movements, reliability was also 98%, plus or minus one frame.

RESULTS

The analysis showed: depressed subjects had a lower activity rate, that is fewer movements and syllables per second, than did the normal comparison; and to a lesser degree, the manic had a higher activity rate. Frequency distributions for the movement durations of each subject were similar; the doctor's speech rate was influenced by the patients when he conversed with them; and the depressed and manic subjects were less consistent than was the doctor.

Body activity

Figure 1 shows cumulative body activity for each subject. The manic had the most with 297, an average of 9.9 movements per second. The psychiatrist was next with 235, or a mean of 7.83. Agitated II (the morning interview, when he is more depressed and agitated) followed with 204 movements, a 6.8 per second average. The suicidal depressed had 158 movements--5.26 per second. Agitated I (evening) totaled 142 movements, for an average of 4.73 per second. Last was the retarded depressed with only 123 movements, or 4.1 per second.

Figure 2 represents the sections showing the entire bodies of the doctor and the retarded depressed, and the doctor and the manic. The following scores resulted: The retarded depressed averaged 2.3 changes per second, and the doctor averaged 7.1 changes during the

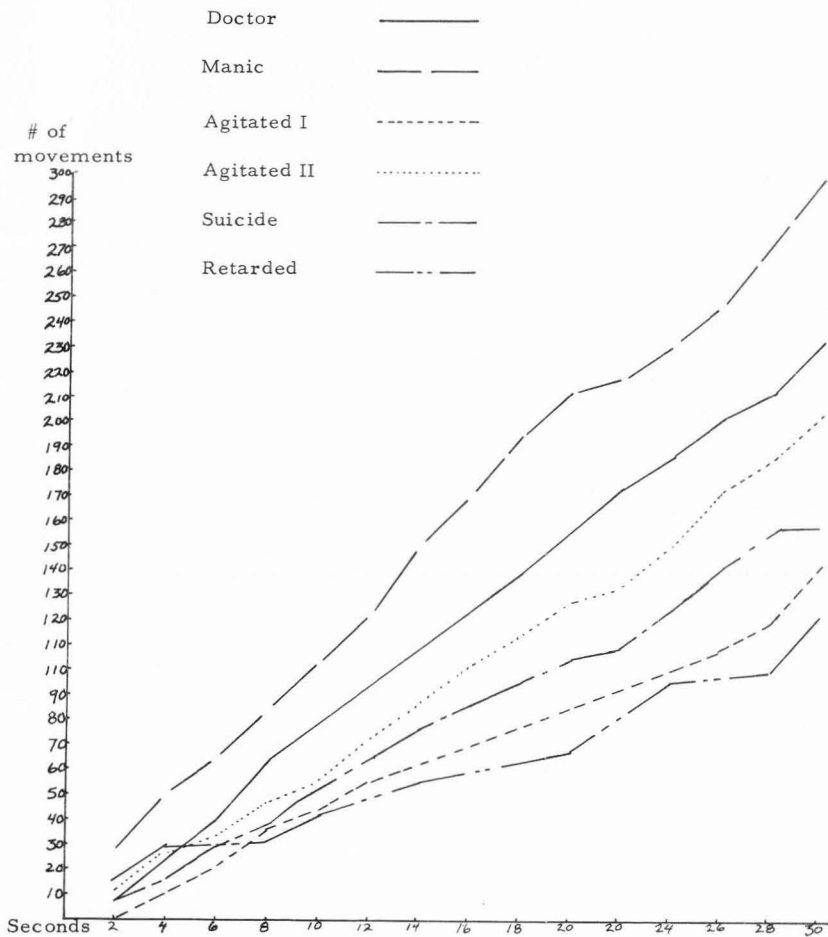


Figure 1. Cumulative body activity

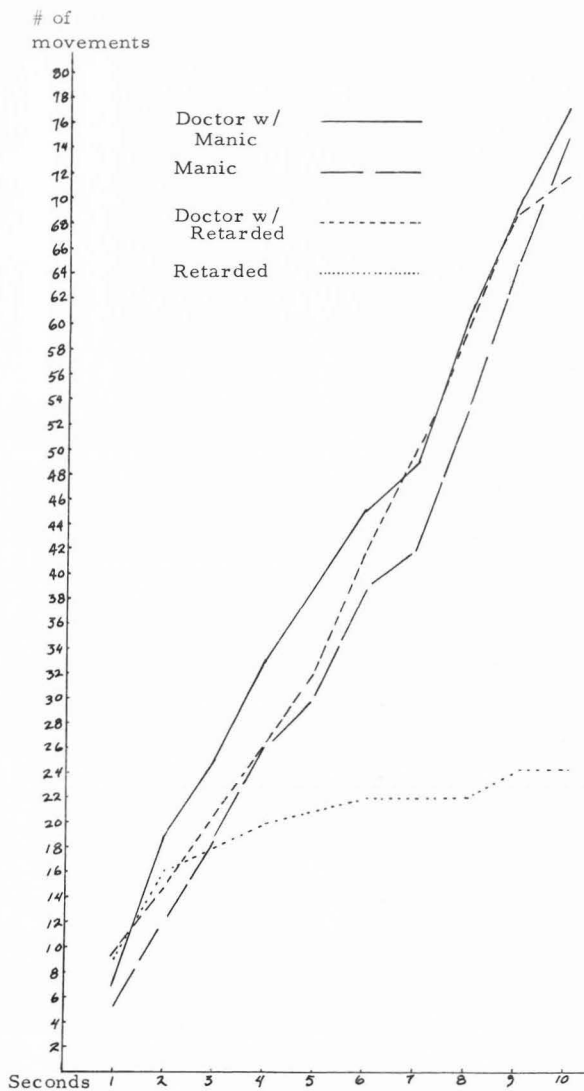


Figure 2. Cumulative whole body activity

same period. The manic averaged 7.4 movements per second, and the doctor averaged 7.7 movements.

The doctor's movements were correlated with those of the two patients to see if an interactive relationship existed. There was a positive correlation of .012 between the doctor and the retarded depressed, and a positive correlation of .33 between the doctor and the manic. Neither score is statistically significant. (See appendix B for graphs of body activity across time.)

Frequency distributions of movement durations

Figure 3 displays the frequency for each subject for a movement of a given duration. All subjects generated similarly shaped distributions, which are skewed to the left with more shorter movements of about four to seven frames (around one-quarter of a second).

Quantal Units

While creating the same general rankings as body activity scores, the subjects come out much closer together when counting quantal units. The manic averaged 3.13 units per second, followed by the doctor at 2.6. The suicidal and agitated patients averaged 2.0, and the retarded depressed averaged 1.43 units per second. (See Appendix B for quantal unit graphs.)

Speech rate

Figure 4 shows a cumulative speech rate, revealing the total

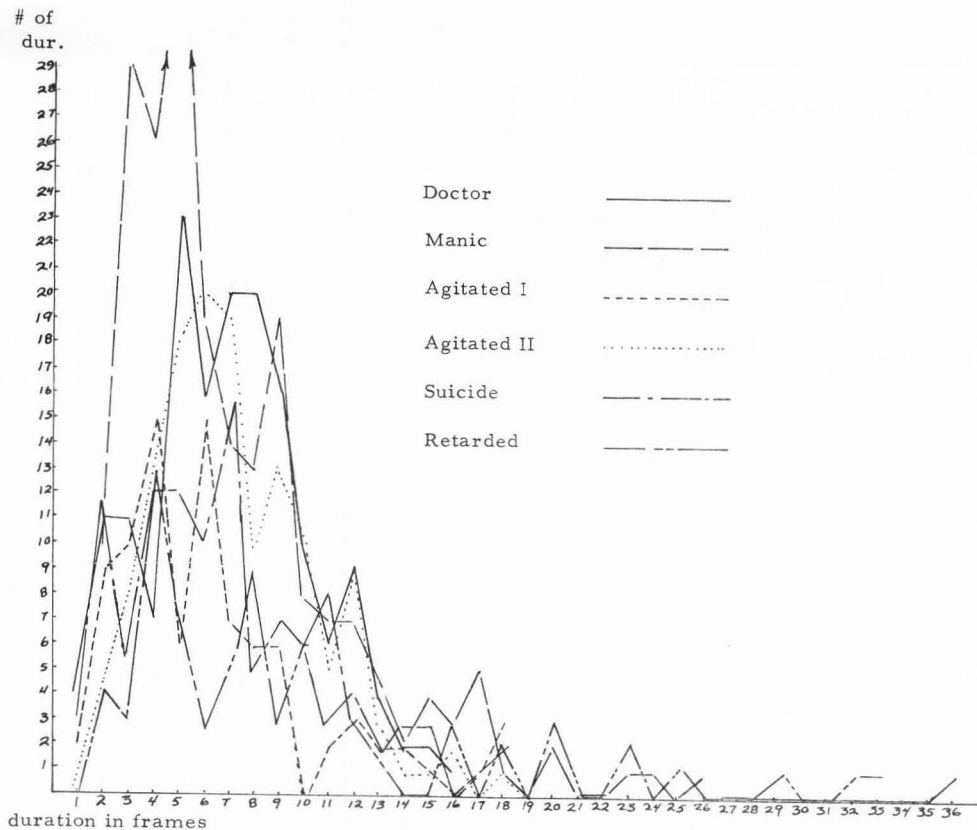


Figure 3. Frequency distribution of movement durations

Syllables

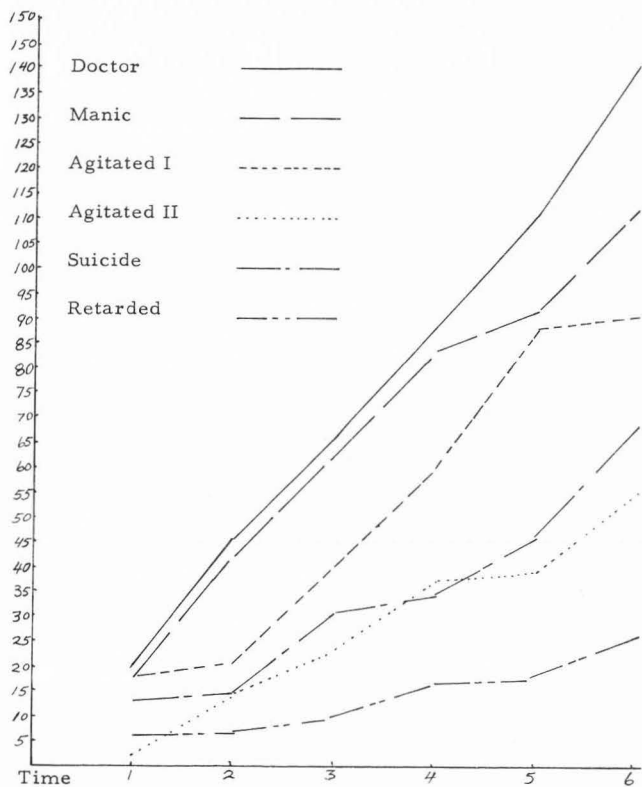


Figure 4. Cumulative speech rates

syllables spoken by each subject during the recorded periods. The doctor had the highest rate, averaging 3.9 syllables per second across his introductions. He was followed by the manic with 3.56 syllables per second. The agitated depressed averaged 3.43 in the evening interview and 3.05 in the morning interview. The suicidal depressed averaged 2.34 syllables per second, and the retarded depressed was lowest with .926 syllables per second.

Figure 5, whows the psychiatrist's speech rate varied in response to each patient. He was consistent across his introductions, but it appears that the depressed patients pulled his rate down. It went from 3.95 to 2.25 with the retarded depressed; 4.17 to 2.81 with the suicidal patient; 4.04 to 2.42 with agitated I and to 3.63 with agitated II. With the manic patient the doctor's rate was pushed up to 4.57 syllables per second, higher than the patient's or his own rate during his introduction. (See Appendix B for a graph of speech rates across time.)

A doctor's introduction is missing from the section for the agitated II patient. This is because the doctor only gave one introduction at the beginning of the film for both agitated I and II.

Consistency within subjects

Table 1 displays the results of chi-square tests performed within subjects taken from across-time data from their scores in speech rate, body activity and quantal units. A significant score indicates that the

A - Doctor Intro.
B - Patient
C - Dr. w/ patient

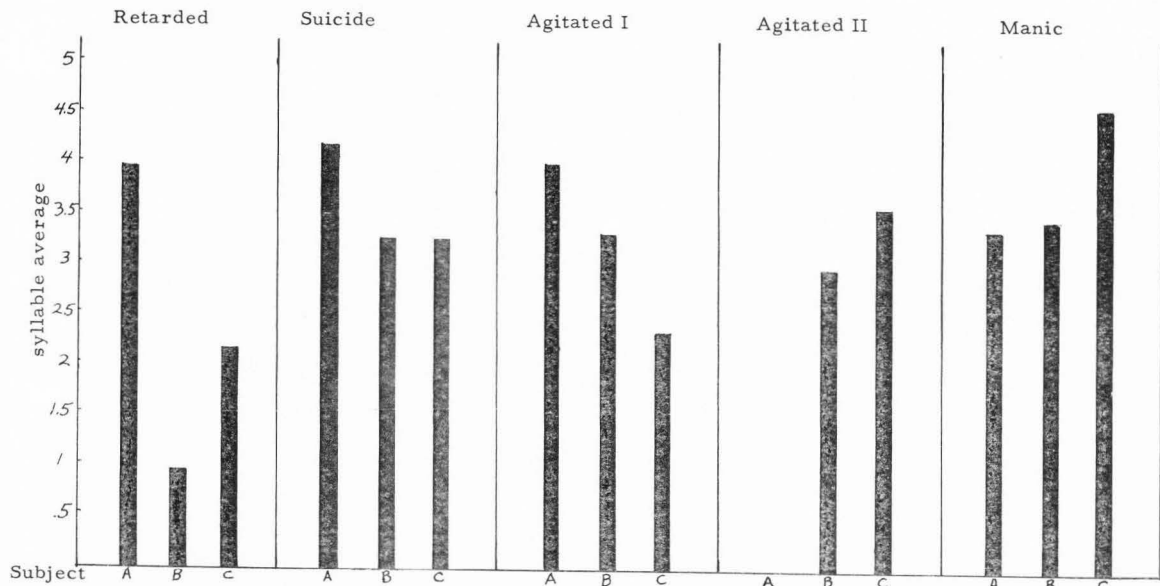


Figure 5. Syllables per second

Table 1. Chi-square analysis

	Speech	Body	Whole body	Quantal
Doctor	X	.01	X	.01
Manic	.01	.01	.05	.01
Agitated I	.001	.001		.01
Agitated II	.001	.001		.01
Suicide	.001	.001		.001
Retarded	.001	.001	.001	.01

X is nonsignificant

Tests were not done for empty cells

Significant levels indicate inconsistency

subject is not consistent across time in his actions or speech. That is, he has an erratic flow, with many movements or syllables in one time period but very few in the next, and so on.

The scores of the depressed and manic subjects were very significant every time, indicating that their movements and speech were not consistent. The doctor's speech and entire body scores were very low, indicating that he had nearly equal numbers of syllables and movements in each time period. His upper body and quantal unit scores were significant, but the chi-square totals were a good deal smaller than were those of the other subjects.

DISCUSSION

The depressed patients are below the manic patient and the psychiatrist (the normal comparison) both in speech and activity scores, indicating that depressed persons have lower activity rates than do normal or manic individuals. The manic subject is shown to have a higher rate than the doctor in body activity, but not in speech.

Limitations

1) The sample was small, so caution should be used in generalizing from it. 2) It is not known why agitated I and II switch places in the body activity and speech charts. The author would put more credence in the body activity. In speech the patient was simply answering questions from the psychiatrist, so his speech rate may have been partially controlled by the content and situation. 3) Most of the body activity data came from film showing the subject only from the shoulders up. While the two entire body sections tend to confirm that this is sufficient information for making proper comparisons, as the same ordering resulted, and the Ekman (1965) study found head data to be best for determining the nature of an emotion, future researchers will find it preferable to use films that show the entire bodies of the subjects as well as close-ups. Such films should be made with nonverbal content in mind, not just content and facial expression.

4) There is a problem with the speech rate score of the normal comparison. It may be that lecturing, as a procedure, produces high speech rates. This would explain the doctor's high score in that category, which is higher than the manic's rate. It should be kept in mind then, that the psychiatrist's speech rate cannot necessarily be validly compared to that of the others. The ideal control would have been to get his rate when he was conversing with another normal person, but this was not possible as all his conversations were with the patients, all of whom influenced his speech rate with theirs. 5) It was not possible to record all the eye blinks of the agitated II subject because of the darkness of his eye areas; as a result his score in body activity should have been a little higher than it was.

Bearing the above mentioned limitations in mind, the following implications of this study can be considered.

Implications for psychodiagnosis

The clinical traditions based on intuition that have developed without the use of film, that depressed persons move and speak more slowly than do normals, and that manics are overactive, have been basically substantiated. These can continue to be useful diagnostic tools for clinicians.

A. Psychomotor retardation. Of the few definitions of an emotional state that refer to body activity, psychomotor retardation is one of the most prominent and universally accepted. Judging from the results of

of this study, it is a misleading term. Psychomotor retardation implies that the depressed patients speech and movements are slower and more drawn out, but that has not been the case in this study. The depressed patient's movements were not longer; there were simply fewer of them, with more pauses in between. When they spoke, it was at a nearly normal speed; it is just that they did not speak very often or say very much.

The frequency distributions of movement durations are similar in shape for all subjects. If psychomotor retardation were an accurate concept the distribution for the depressed person would be skewed to the right, indicating more long movements.

Why does this similarity of distributions exist? With speech, it may be a function of some innate mechanism in all people. When speech is slowed down or sped up on a tape-recorder it becomes unintelligible; as a result, the speed of one's speech production is probably biologically regulated, whether one suffers from a mental illness or not.

Due to lack of interest in his surroundings or because of a lack of psychic energy, it is difficult for the depressed person to speak or move. It may also be that the periods of silence and inactivity are attempts to control and repress anger or hostility that the patient fears will explode forth. However, when he does move it is similar to anyone else--he simply has fewer movements, with more pauses in between. The manic, by contrast, has an overabundance of interest and energy. He expresses it more often as a result, but

again with similar durations to anyone else.

Another theoretical possibility that should be explored is that of social reinforcement. It may be that depressed people do very little because they get no reinforcement from others for what they do. They would figure: 'why bother to speak or do anything, no one cares anyway'. When they are drawn out, or must speak or move, it would be in a pattern that is essentially normal.

B. Different "depressions". There are also differences in activity rate between the different types of depression. The agitated depressed subject had the most movements, followed by the suicidal and then the retarded depressed. Ways need to be devised to train clinicians to recognize the activity rate of a patient, and then use that information to help place him in the proper diagnostic category. Watching demonstrations films would probably be part of this process.

C. Consistency of activity rate. The internal consistency of one's action rather than its duration may be the useful tool for distinguishing between normal and depressed or manic persons. The doctor was relatively more consistent, while the others were always very inconsistent, or erratic in their flow of speech and movement. This is a psychomotor indication of psychopathology that has not previously been considered.

The implication here is that emotional disorders are not always on the same level, but are constantly fluctuating between high and low

levels of activity. A normal person stays more consistently within the boundaries of the activity field that corresponds to his state. This pattern would never have been detected if short, disconnected sections of film for each subject had been analyzed, instead of the longer, continuous segments that were.

Implications for theories of family interaction

Family therapists (Haley, 1971; Jackson & Weakland, 1961) emphasize the importance of family homeostatis in human interaction. This means that there is a certain psychological climate in a family and that attempted deviations from that state by any member is resisted by the others. That is, they will try to pull that deviating member back up or down to the previous emotional level.

When one adds Beier's (1966) contention that children learn non-verbal cues from their parents, the following construct evolves: Children may grow up learning certain psychological ways of being, part of which is nonverbal. As these patterns are developed, and especially if they are pathological, it is difficult to change them due to the homeostatic forces within the family.

Activity rate studies may serve to add empirical support to such conceptual theories. This study found that the speech rate of the doctor was influenced by that of his patients. If the same is true for body movement, as one would suspect, (even though the films did not allow the author to investigate that possibility) then it may be that one

can pass on his emotional state to another by way of activity rate. A mother is nervous for instance, and communicates that to her child by way of her high, agitated activity rate. The child picks up those nonverbal cues and reacts by being colicky.

In this study the direction of influencing was always from normal to abnormal. This may not always be the case, but in the occasions that it is, it would be reasonable to assume that a depressed parent, for instance, could bring his spouse and children down to a depressed activity level, making for a depressed family (or maybe they would be induced into a different reaction, such as anger). This would be accomplished in part by the first person influencing the speech and activity rates of the others with his own rates. Once obtained, deviations from that level would be resisted by the reinforcing quality of the environment, where each member influences the others to maintain the prevalent activity rate.

The emotional state, therefore, feeds upon itself and perpetuates across time and individuals. What is sometimes ascribed to genetics or trauma may in fact be learned behavior and belong in the camp of social learning theory. One develops through his family an activity rate, and as a result, the emotional state that goes with it.

Implications for psychotherapy

Is it the mood that creates the activity rate, or is it the other way around; or is it an interaction? Can an emotional illness be

altered by modifying the activity rate? Can one develop the emotional state of another by picking up his activity rate?

Beier (1966) suggests that man sends out nonverbal cues that are unconsciously intended to determine the response of the person with whom he is interacting. When he is successful, it serves to perpetuate his present emotional state. The therapist can change that by not reacting in the expected way, forcing the client to explore new ways of interacting. Similar forces appear to be at work in family pathology and intervention.

In light of activity rate, treatment could be affected by altering the patient's activity rate, and therefore along with it, his emotional problem. This would be done by modeling a new rate, rather than reinforcing his old one. In essence, this is what one appears to be doing when he tries to calm down an agitated friend by speaking slowly and calmly himself. Such treatment would need to be done on entire families, as most family therapists prefer for their interventions, otherwise untreated members would react to the others.

SUMMARY

This exploratory study has provided data which suggest the following distinctions between depressed, manic, and normal persons:

1) depressed individuals have lower activity rates, that is, fewer movements and syllables per second, than do normals; 2) manics, have a higher activity rate than do normals, but the magnitude of difference is not as great as for the depressed-normal comparison; 3) both manics and depressives have less consistency in speech and body activity than do normals; 4) one's speech rate can be influenced by the rate of another with whom he is conversing; and 5) frequency distributions of movement durations are similar for all subjects.

There have been studies of nonverbal action and its possible significance, but this is the first micro-analysis of actual body-part movement rates as a function of different psychological states. If larger scale studies confirm the results of this study then its many implications in the areas of psychodiagnosis, development, interaction, and treatment should be explored.

As seen by the author, the following issues emerge as central theories which warrant further investigation. Infants are capable of and do absorb emotional cues from their parents and others in their environment. A part of this appears to be activity rate. An individual

may influence those with whom he comes in contact to imitate and therefore reinforce his patterns. Within a family then, certain patterns will develop and be perpetuated by mutual reinforcement. Some emotional states are related to certain activity rates and are therefore probably learned in part. As a result, therapeutic intervention should probably include helping clients alter their activity rates.

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APPENDIXES

Appendix ASample Data Sheet

Sample Score Sheet

Frames	blink	Head	Torso	Mouth
2000				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
20				
1				
2				
3				
4				
5				
6				
7				
8				
9				
30				
1				
2				
3				
4				
5				
6				
7				
8				
9				
40				
1				

each arrow-head and the beginning of each line that isn't connected to a preceding one is counted as a movement.
 each circled area is a quantal unit.

Appendix BFigures 6-10

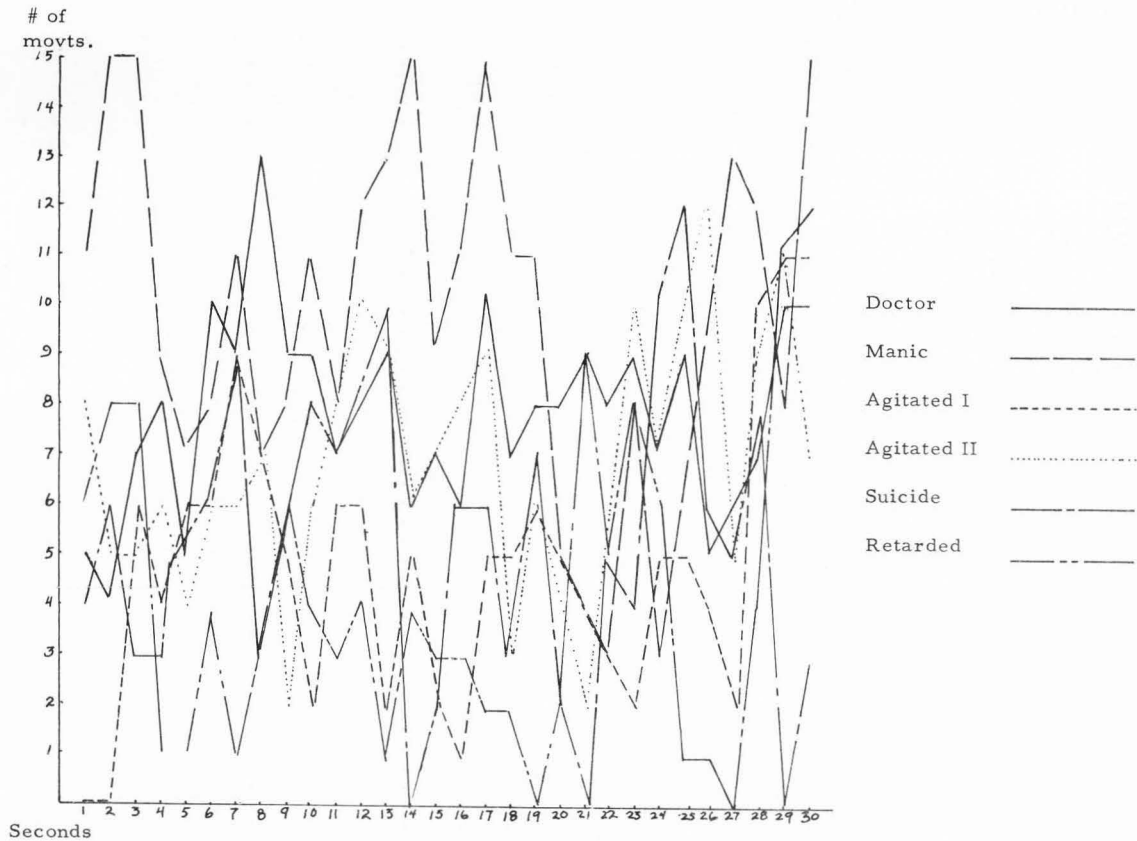


Figure 6. Body activity

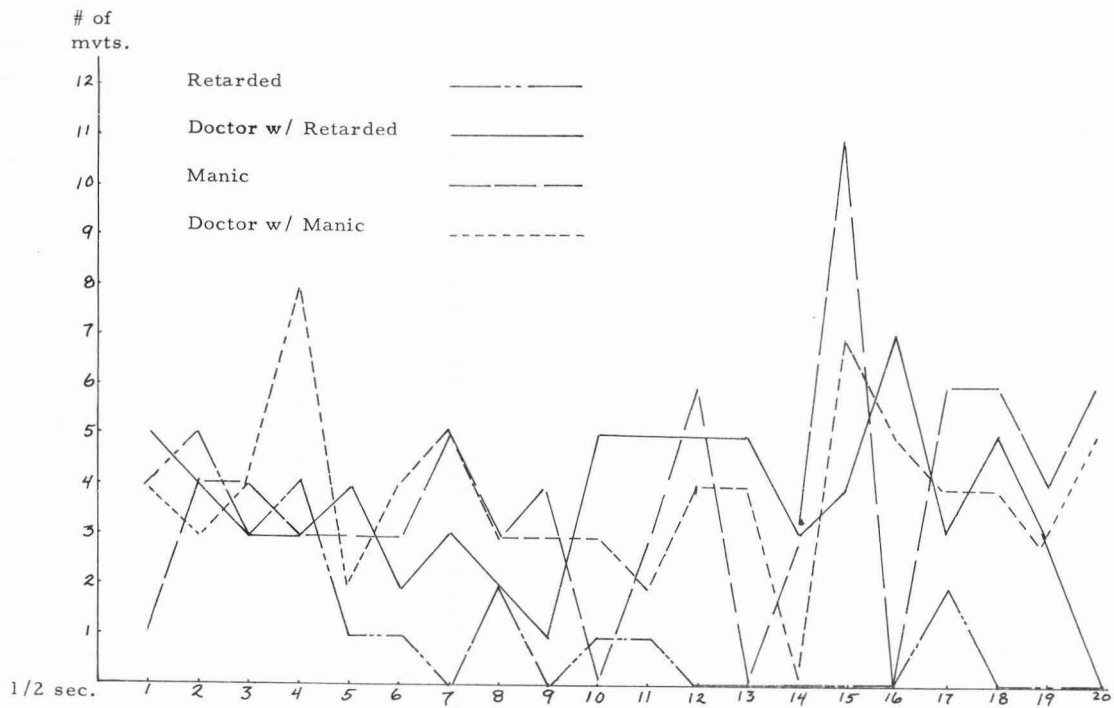


Figure 7. Whole body activity

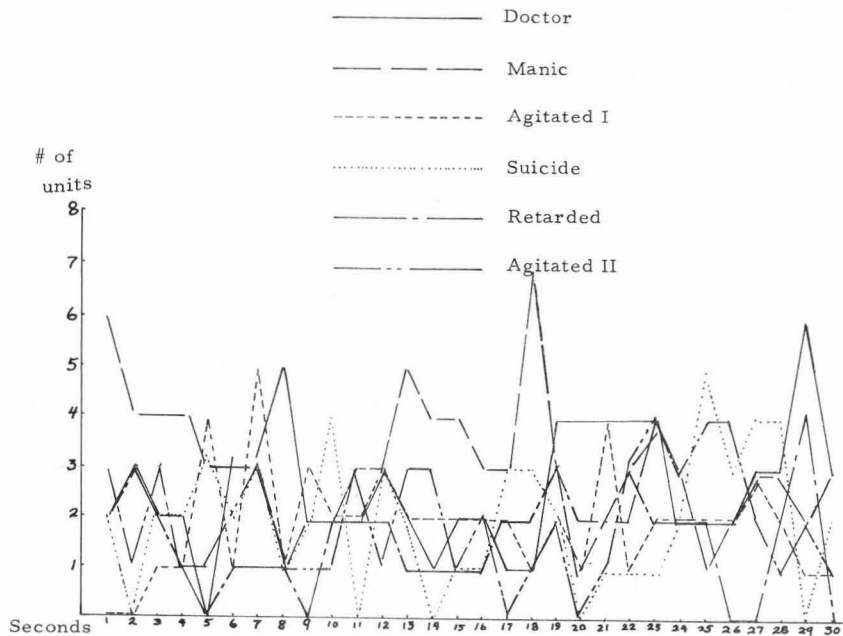


Figure 8. Quantal units

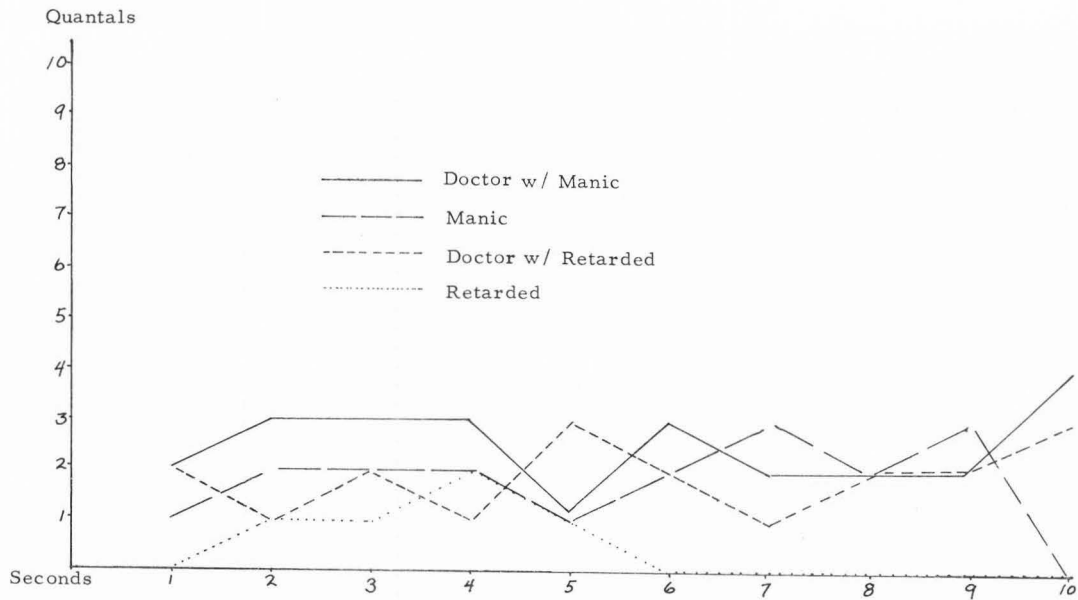


Figure 9. Quantal units

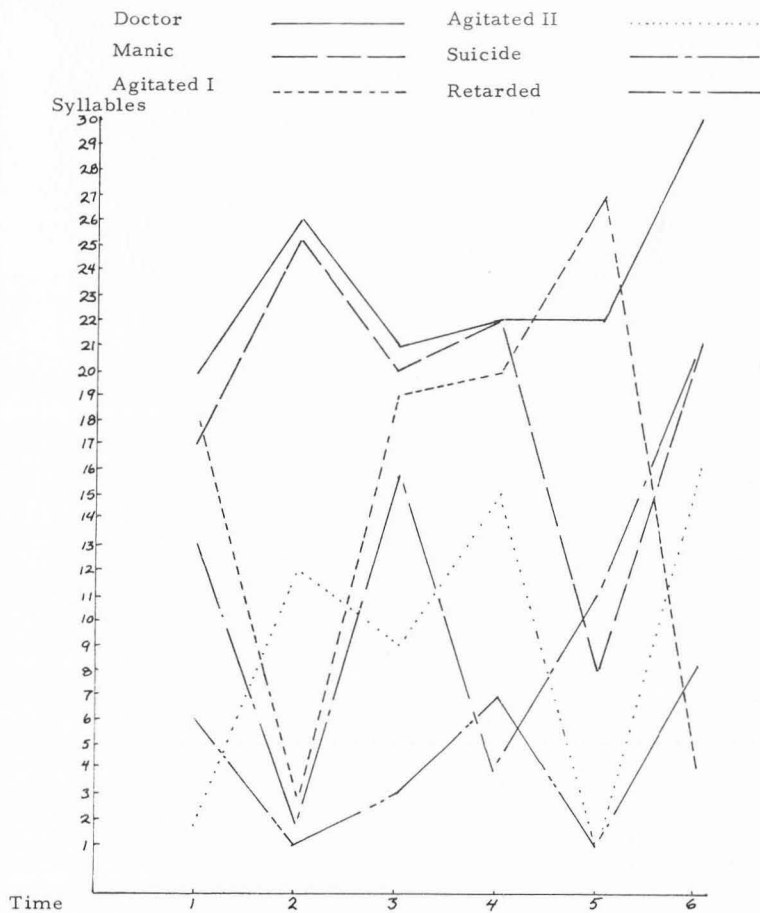


Figure 10. Speech rate

Appendix C

Transcripts of the Psychiatrist's
Introductory Remarks

The following paragraphs are from the doctor's introductions describing the retarded depressed, the suicidal depressed, the agitated depressed, and the manic subjects.

The patient we will see presents a picture of depression which is characterized by pronounced retardation. She has become extremely slow in her movements, speech and mental processes. Her energy output is reduced to a minimum so that her gait has become stiff and she has lost the natural free pattern of body motion. Her voice has become almost inaudible.

Some patients may become so desperate that suicide seems to be the only way out. The next patient has been depressed to this point. Loner depression is not an acute unexplained illness as in the other patients but rather the final reaction to an unbearable life situation.

The patient you will see presents the agitated type of depression. Though, the degree of his agitation fluctuates a great deal in the course of the day. Most depressed patients are more depressed in the morning and feel better in the evening. Technically we speak of diurnal fluctuations in the patient's movement. In everyone of his attacks he has expressed the morbid fear of losing his eye sight. Such unfounded fears of losing faculties or worldly goods are common symptoms in depressive states.

The manic stage is characterized by a triad of symptoms: one, over activity; two, increased and accelerated ideation; three, elation, euphoria is the dominant mood. The general impression one gets is that of the bright, unduly restless and alert person who is easily distracted. For example, our patient will undoubtedly pay a good deal of attention to the surrounding lights and camera. Her voice has become hoarse from continuous talking and singing.

VITA

Bron B. Ingoldsby

Candidate for the Degree of

Master of Science

Thesis: Comparisons of Body Activity in Depressed, Manic, and Normal Persons

Major Field: Family and Human Development

Biographic Information:

Personal Data: Born in Lindsay, California, January 11, 1950, son of Norman and Daphne Ingoldsby; married Valerie Percevault April 18, 1974.

Education: Graduated from Lindsay High School in 1968; received Bachelor of Arts degree from Brigham Young University, with a History major and Spanish minor, in 1974; completed requirements for Master of Science degree in Family and Human Development from Utah State University in 1976.

Experience: Gained teaching experience through special courses at Brigham Young and Utah State University; held a research assistantship in the Family and Human Development department at USU; did volunteer work at the Utah State Mental Hospital in 1975.