# SENSITIVITY OF PARANOID PATIENTS TO NONVERBAL CUES

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## Abstract

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To test the hypothesis of a special sensitivity on the part of paranoid patients to nonverbal cues, two video-tapes were prepared for viewing by 24 paranoid patients and 24 normal control subjects. Half of each group saw a video-tape of genuine stimuli and the other half saw a video-tape of posed stimuli. The stimuli consisted of 40 6-second shots of the same four persons on each tape. These persons' faces were shown as they watched two lights serving as signals for the administration or non-administration of electric shock. For the genuine tape, shock was administered after the appropriate signal; for the posed tape, stimulus subjects posed their expectation. Viewing subjects were unaware of the posing condition and were asked to judge whether, at each presentation, the stimulus person expected or did not expect to receive a shock. Patients demonstrated significantly higher accuracy than normal subjects for genuine stimuli, while normal subjects were significantly more accurate than patients for posed stimuli. Normal subjects were significantly more accurate for posed stimuli than they were for genuine stimuli, while patients were not. The data were interpreted as having confirmed the hypothesis of a greater sensitivity to nonverbal cues on the part of paranoid patients. The implications for therapy and for psychological research in general were discussed.

## Acknowledgements

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Clinicians frequently refer to a special sensitivity on the part of schizophrenics to the non-verbalized emotional nuances of interpersonal communications (Boyer, 1967; Lidz, 1973; Turner, 1964). Comments such as, "If you want to know the real mood on the ward, ask the schizophrenics," are not uncommon.

One theoretical perspective out of which such a sensitivity could be inferred is the double-bind theory of schizophrenia formulated by Bateson, Jackson, Haley, and Weakland (1956). According to this theory, one who becomes identified as schizophrenic has been exposed from early childhood to interpersonal communications of such a nature that they place the person receiving them in a "double-bind." These communications are paradoxical in character; they express two statements, each of which precludes the other. Further, the recipient of the mixed messages is in a dependent relationship to the sender and is thereby psychologically unable to reject them in whole or in part (Bateson, et al., 1956).

For example, a mother may tell her small child to play with his friends and have a good time, although simultaneously she communicates a pouting, "How can you leave me?" tone or facial expression. By choosing to stay the child risks mother's ire for his non-compliance with the verbal command. On the other hand, in choosing to go, the child risks coldness from mother (whose warmth is needed) because he preferred his friends' company to hers. The child will thus be guilty of offending either way; he is in a "double-bind."

The proponents of the double-bind theory suggest that persons who become labelled schizophrenic commonly use three methods of dealing with double-binding situations. These three methods match the behavior of three classic categories of schizophrenia: inaction or paralysis (catatonia); a "silly" mixing of the two parts of the communication, e.g., in the hypothetical "bind" described above, the child might run back and forth between the two situations (hebephrenia); and a search for further meaning within or beyond the communication itself that would explain what is really meant (paranoia) (Watzlawick, Beavin, & Jackson, 1967). Some support for this view is found in the work of Bugental, Love, Kaswan, and April (1971), who demonstrated that families of disturbed children give more conflicting messages than do families of normal children.

It can be inferred, then, that out of the long experience of alertness for the covert meanings of communications, the schizophrenic acquires a special sensitivity to those cues that convey the covert message. One would also expect these cues to occur more often at the nonverbal level since it is usually at the verbal level that human communication has its face value. One possible explanation of why this is so may be that the body cues (as opposed to semantic) which are generally subsumed under the label "nonverbal" (voice tone or inflection, muscular and postural movements or stances) have no universally agreed upon meanings, at least not any that have been identified (Birdwhistell, 1963). They can therefore be considered ambiguous. The meanings of words, on the other hand, have greater (though not absolute) universal agreement. Because of this difference we can, in a sense, be held responsible for our words but not for our nonverbal expressions. A message, then, that is communicated covertly may be more readily transmitted through nonverbal channels. Berger (1965) has, in fact, demonstrated that the schizophrenic is confronted more often than the normal person with negative emotional communications at the nonverbal level which conflict with the verbal messages.

In addition to clinical lore and theoretical inference, there is some experimental evidence suggesting that schizophrenics possess a special sensitivity to nonverbal cues. One study suggests that schizophrenics can be more aware of the feelings of others and their implications than are normal persons. Helfand (1956) administered a test of empathy in written form to four groups of subjects: chronic schizophrenics on locked wards, schizophrenics with ground and other privileges, hospitalized TB patients, and non-hospitalized normal persons. The test consisted of the presentation of the history of a depressed person given in his own words, with the task of predicting his behavior which was already known to the experimenter. Those with the highest mean accuracy score were the schizophrenics with hospital privileges. The conclusion he drew was that normal persons appear to respond to a "generalized other," a stereotyped concept of what another person's behavior and feelings are expected to be, while the schizophrenic who functions sufficiently to articulate his perceptions responds instead to the individual's particular behavior and feelings. Helfand's conclusion would suggest that the empathy he found in schizophrenics was based on their response to cues other than those given in normative social presentation.

While not relating directly to schizophrenia, the work of Rosenthal, Archer, Koivumaki, DiMatteo, and Rogers (1974) revealed that the most accurate interpreters of nonverbal cues presented at very high speeds were those persons who also rated very low in social competence on the California Psychological Inventory. They concluded that these persons appear to "know too much."

Turner (1964) looked specifically at the question of sensitivity to nonverbal cues on the part of schizophrenics. Although he found them to be less accurate than normal persons, he found that the patients articulated their awareness of and difficulty with the fact that the stimuli were posed. This would suggest that some of his patient subjects did indeed respond accurately to certain nonverbal cues, although they were not the ones under experimental control.

That nonverbal cues can be associated with specific emotional states has been demonstrated by Leventhal and Sharp (1965). Further, that a particular emotional state can be distinguished from others by an observer has also been demonstrated (Buck, Miller, & Caul, 1974; Buck, Savin, Miller, & Caul, 1969, 1972; Davitz, 1964; Frijda, 1953; Gubar, 1966; Lanzetta & Kleck, 1970; Miller, 1967).

Thus far, only Turner (1964) and Vandenberg (1962) have specifically examined the question of a difference between schizophrenics and normal persons in accuracy of judgment of nonverbal cues expressive of an emotional state. Izard (1959) examined the difference between paranoid schizophrenics and normal subjects in perception of emotion using photos of faces, but was not concerned with the question of accuracy.

Vandenberg hypothesized that schizophrenics would be less accurate than normal persons in judgment of facial expressions of emotion. He based this hypothesis on the double-bind theory, reasoning that since the identified patient has learned early about the psychological danger of being "on target" in his statements concerning the messages delivered to him by significant persons (i.e., it would be psychologically dangerous for him to point out openly their destructiveness), he learns to move somewhat "off target" and is therefore less accurate in his verbalized judgments. The task he presented to his subjects (normal persons, paranoid schizophrenics, non-paranoid schizophrenics, and non-psychotic psychiatric patients) was to label the emotion expressed in photographs of a number of persons' faces taken from magazines. The schizophrenics proved less accurate than the normal subjects, using as a standard the labels agreed upon by selected raters.

It is this last feature, using raters to establish the standard of accuracy by selecting a label, that may be questioned in Vandenberg's study. His raters were 10 members of the research project staff, five of whom were psychologists or psychiatrists. This procedure can be faulted in two respects, one concerning the use of raters and the other concerning the use of labels.

First, objective criteria were lacking for determination of the true experience reflected in the person's facial expression. Instead, Vandenberg selected raters from the normal population, at least half of them professionals. In effect, consensual validation by a small sample from the same population as the control group was used to establish the standard of accuracy. But by reason of diagnosis, the psychotic population has already been found to operate outside the bounds of consensual validation operating for normal persons. In this respect Vandenberg's test might well serve as another diagnostic tool because it appears to correlate with the diagnosis of schizophrenia. He has not, however, demonstrated that schizophrenics are objectively less accurate in their judgments than normal persons.

Second, until an objective basis for determination of accuracy has been established, no one can be assumed to be an expert at this task. Mental health professionals may not be the best group from which to select raters for judging emotional expression. Truax and Mitchell (1971), for example, found that the average score on the Truax empathy scale obtained by clinical psychology and counseling psychology graduate students was only 2.5 on a 9 point scale, a score below the 5.0 required for acceptance into Truax's therapist training program.

The second area of criticism of Vandenberg's study concerns the use of labels. A single facial expression can be the product of a complex emotional state for which several labels could be validly judged appropriate; labels tend to overlap and can therefore cause confusion in a subject required to select only one; they also involve too heavy a reliance on verbal material which can arouse unknown associations for schizophrenic subjects (Turner, 1964).

Turner's study involved the use of nonsense sentences read by an actor simulating six different emotions. His schizophrenic subjects (both paranoid and non-paranoid) failed to identify as accurately as normal persons which emotion was being expressed. However, two factors might explain this failure, as Turner has noted. First, it cannot be assumed that schizophrenics will make no associations with the nonsense words, i.e., that the nonsense words have equal neutrality for control and experimental subjects. In fact, some of Turner's patient subjects did articulate that their method of judgment was based on associations with the stimulus words, a factor which interfered with the task intended by the experimenter.

Second, the element of simulation of emotional expression proved to interfere with accurate judgment, especially for paranoid subjects. When asked to judge which of six given emotions was being expressed, some of these subjects recognized the simulated nature of the readings and were reluctant to select an unqualified label for the emotion. One of them went so far as to preface all of his responses with the qualification "simulated" (e.g., "simulated anger," "simulated fear").

This factor of simulation of emotional states has been a stumbling block in studies of judgment of nonverbal expressions. Frijda (1969) noted that the varying nature of the stimuli used across studies is one of the factors responsible for widely differing results and has made it impossible to compare and interpret them. Tagiuri (1969) also referred to this problem as well as to the question of accurate labelling. Since simulated material is known to increase accuracy of judgment by up to 50% as compared with genuine material (Gottschaldt, as cited in Frijda, 1969), the question of validity of measurement can be raised. Is a subject able to distinguish actual anger or merely a stereotyped representation of anger, and are these abilities equivalent?

In dealing with this issue, some researchers have attempted to provide genuine stimuli by filming elicited facial expressions in interviews (Frijda, 1953) or by capturing naturally occurring expressions in photos (Munn, 1940; Vandenberg, 1962). However, another aspect of the validity question remains--this is the problem of applying the appropriate label to the spontaneous facial expression. The methodological difficulties inherent in the use of labels and of raters to select them has already been discussed.

The possibility of a resolution of these difficulties appeared in the work of Miller (1967), Miller, Banks, and Kuwahara (1966), and Miller, Banks, and Ogawa (1962, 1963). In extended research with rhesus monkeys, Miller and his associates developed an experimental situation in which the monkeys, by pairs, were faced with a cooperative avoidance task. The monkeys were first trained individually to avoid electric shock by pressing a lever when presented with a conditioned stimulus signalling administration of shock at its cessation, a few seconds after onset. Another conditioned stimulus signalled no shock. Following this, one monkey was placed in a room with the conditioned stimuli before him but with no lever available for avoidance of the shock. In another, remote room, a second of the pre-conditioned monkeys was placed before a closed circuit TV screen which showed only the face of the first monkey. This second monkey, however, had access to the lever for avoidance of expected shock, and by pressing it could avoid shock both to himself and to the first monkey. No sound was exchanged between them. The results demonstrated that the second monkey pressed the lever more often when the monkey whose face he saw was presented with the conditioned stimulus for shock.

Several researchers have adapted Miller's experimental procedure for human subjects (Buck, Miller, & Caul, 1974; Buck, Savin, Miller, & Caul, 1969, 1972; Gubar, 1966; Lanzetta & Kleck, 1970). All of these involve placing the stimulus person in a clearly defined situation and requiring an observer subject to judge, only by viewing the face of the stimulus subject, which of a given set of alternative stimuli is the one being presented on each trial to the person he views. Thus, the experience of the person viewed can be operationally defined and imprecise labels are eliminated.

The present study, then, was designed to examine the accuracy of paranoid and normal subjects in judging facial expressions under genuine and simulated conditions. Paranoid subjects were chosen for several reasons. First, because paranoid and non-paranoid schizophrenics are known to perform differently on psychological experimental tasks (Silverman, 1964), they should not comprise a single experimental group. Second, it is known that the paranoids generally suffer least impairment of intellectual functioning (Ginett & Moran, 1964; Moran, Gorham, & Holtzman, 1960). Third, it was this group which Turner found to be most cooperative and capable of articulating the distinction between genuine and simulated stimuli.

The difficulty in responding to simulated stimuli demonstrated by Turner's subjects suggested that fruitful results could be obtained by comparing paranoid and normal subjects' performance on two kinds of stimuli, simulated and genuine. We hypothesized that a greater sensitivity to nonverbal cues on the part of paranoid subjects would produce greater accuracy than normal subjects in judging genuine stimuli. However, we hypothesized that a greater sensitivity to nonverbal cues would elicit more conflict in a paranoid subject when he is presented with simulated or posed stimuli, and would result in reduced accuracy if the pose or simulated expression were used as the basis for a correct answer. Thus, we hypothesized that paranoid subjects would be less accurate than normal subjects in judging simulated stimuli.

Further, we expected that normal subjects would obtain higher scores for simulated stimuli than for genuine stimuli. This was based on Helfand's conclusions (1956), and Gottschaldt's findings (cited in Frijda, 1969) which showed an increase in accuracy when posed material was used. Finally, since Gubar (1966) found greater accuracy on the part of those subjects who received before testing a sample of the electric shock administered to the stimulus subjects, we expected similar results from our subjects, i.e., we hypothesized that those subjects who had experienced the physical stimulus administered to the persons they saw on the video-tape would be more accurate.

## Method

### Subjects

The selection of patients as experimental subjects raised the problem of diagnosis. Freeman (1969) has stated that there are "no universally agreed upon criteria on which a diagnosis (of schizophrenia) can be based," and concluded that "the diagnosis is entirely dependent on the psychiatrist's conception of schizophrenia" (p. 330). Many researchers now favor selection procedures based on rigorous specification of symptoms in defining a patient population for research purposes (Bannister, 1971; Rabin & King, 1958).

In line with this approach, we avoided direct assessment for schizophrenia as a criterion for selection. Patients were selected who had been hospitalized for psychiatric treatment, were currently in treatment, and who, at some point from the time of admission to hospital to the present, exhibited symptoms of paranoia sufficiently for these to be a focus of the treatment. These symptoms were found by Venables and O'Connor (1959) to correlate with a diagnosis of paranoid schizophrenia as distinct from other forms of schizophrenia. They were: delusions of persecution, delusions of grandeur, delusions of external control, and ideas of reference. Evidence of these signs, as noted in progress reports, was required for the patient's inclusion in the experimental group (Appendix H).

Criteria for exclusion from the patient sample were: a history of drug addiction, CNS dysfunction, toxic psychosis, lobotomy, and electroconvulsive therapy received within two months of testing. No subjects were accepted from locked wards because of the demanding supervisory arrangements required to test them. It might be noted that our sample selection criteria exhausted the supply of patients in the psychiatric hospital where the study was conducted. Seven patients met the selection criteria but refused to participate in the study. All experimental subjects were on medication, typically the major tranquilizers, e.g., chlorpromazine, trifluoperazine, and fluphenazine.

Additionally, all subjects, both control and experimental, were required to demonstrate at least average intelligence so that low performance in the experiment proper could not be attributed to deficiencies in intellectual functioning. Subjects were accepted if they obtained an IQ of 90 or better on either the Quick Test of Verbal Intelligence or the Revised Beta Test of Nonverbal Intelligence. Data on intelligence test scores and ages of subjects are contained in Table 1. The differences between the diagnostic groups for age and verbal IQ were not significant. The significant difference ($p < .001$) between the groups for Beta IQ, with paranoid subjects lower than normal controls, was attributed to the effect of medication and anxiety on speed, coordination, and vision.

While an attempt was made to obtain equal numbers of males and females, it was not possible to locate enough female patients who met our sample selection criteria. Instead, a balance in number of females and males was maintained in the assignment of experimental subjects to sub-groups. All subjects, experimental and control, were Caucasian.

Control subjects had no history of psychiatric treatment. Although both experimental and control subjects represented lower to upper-middle classes in socio-economic status, the upper-lower and

Table 1

Ages and Intelligence Test Scores
of Diagnostic Groups Compared by t Tests

| | Normal subjects | Paranoid subjects | p |
|---|---|---|---|
| Age | | | |
| Range | 19 - 45 | 20 - 45 | |
| Mean | 29.08 | 31.96 | n.s. |
| SD | 9.17 | 7.43 | |
| Quick IQ | | | |
| Range | 84 - 128 | 84 - 128 | |
| Mean | 99.81 | 101.13 | n.s. |
| SD | 9.42 | 9.55 | |
| Beta IQ | | | |
| Range | 86 - 123 | 85 - 114 | |
| Mean | 108.54 | 97.62 | $<.001$ |
| SD | 8.68 | 8.76 | |

lower-middle strata predominated for both subject groups. Similarly, a broad range of education was represented in both groups. Persons with post-graduate university training were excluded; however, because of the greater likelihood of their sophistication with regard to research procedures.

The 24 experimental subjects selected were receiving treatment at the Douglas Hospital in Verdun, Quebec, Canada; the 24 control subjects comprised Douglas Hospital staff, citizens on welfare, and a number of persons belonging to a women's club. The groups from which control subjects were drawn were approached with the request for volunteers to participate in a psychological study for which they would receive payment.

## Materials

The stimuli for subjects comprised two video-tapes: the "Loyola" tape consisted of 40 shots of genuine facial expressions; the "Sir George" tape consisted of 40 shots of simulated facial expressions. These code names were used to identify the tape to the experimenter and not to the subject. The same four persons (two females aged 35 and 36, and two males aged 25 and 29), identified as "stimulus subjects," appeared in both tapes.

The stimulus subjects received no information concerning the purpose of the study. They were told that they would be paid $10 for their participation in an experiment which involved electric shock and video-taping. Stimulus subjects were seen individually. As each one entered the experimental room, the video camera was already operating, without the subject's awareness. The experimenter explained (Appendix

A) that a series of preliminary trials would be necessary before taping began and instructed the stimulus subject to sit in the chair that faced both the camera and a pair of lights which served as the signals. The camera, 2.5 m from the subject, was set to record only the complete head (front view) of the stimulus subject. The two signal lights, 1.25 m above floor level and 1.25 m from the subject, were positioned on a frame, through which the camera shot (diagram in Appendix C). The lights, one red and the other white, were set 5 cm apart in a metal box that was 10 cm wide. All recording equipment was concealed from view under a desk. A one-half inch Sony AV 3400 portable Videocorder was used for all recording and playback.

<u>Preparation of "Loyola" tape: genuine expressions</u>. The experimenter attached one electrode to the index finger and one to the middle finger of the stimulus subject's non-dominant hand. After a sample of the shock was administered to the subject, the series of trials began. In random order, the experimenter switched on one or the other of the two lights for 6-seconds and then switched it off, administering simultaneously the electric shock (80 volts) after the red light but not the white. After a pause of 8-seconds, the next trial was presented. This randomized sequence was observed for 20 trials, in such a manner as to ensure 10 red and 10 white light presentations. Before the fourth presentation of the red light, the voltage level of shock was increased to 95 volts. This was intended to prevent possible adaptation to the lower voltage. Those subjects were selected for inclusion in the final tapes who remained unaware of the operation of the camera and who demonstrated a visible response to the administration of shock.

Thus, genuine facial expressions of the four persons, each expecting shock 10 times and expecting no shock 10 times, were recorded on the video-tape. A verbal signal (experimenter said, "Now") marked the point on the tape at which the light was switched on; this was required for purposes of subsequent editing. Only the 6 seconds of facial expression recorded immediately following a signal were used on the final tape. The shock reaction was never shown to subjects who viewed and judged the tapes.

In order to assemble on one tape 20 genuine expressions of expectation of no shock and 20 genuine expressions of expectation of shock, the last 5 of each stimulus subject's 10 reactions to each signal light were used whenever possible. The first five were treated as learning trials, except when technical recording problems made it necessary to draw from them. Five genuine expressions from each of the four subjects for expectation of shock and five genuine expressions for expectation of no shock from each of the four subjects were randomized over the two types of signal and over the four stimulus subjects. Thus, the edited "Loyola" tape contained 40 shots of genuine facial expressions (6-seconds duration each), separated by pauses, each of 24-seconds duration. The experimenter's voice announced "Stop" at the end of a 10-second interval during the pause which followed each shot. This 10-second interval was the time allowed for subjects to give their answer; a few seconds later came the announcement of the next trial number.

<u>Preparation of "Sir George" tape: simulated expressions.</u> After the genuine facial expressions were video-taped, the electrodes were

removed and the subject was told that the camera had been on. He was then informed (Appendix B) that the series of signal lights would be presented again but without electric shock. He was asked to pose his responses to this series as if electric shock were to follow the red light.

Again, in editing to produce a tape with 20 simulated facial expressions of expectation of shock and 20 simulated expressions of expectation of no shock, the stimulus subject's first five responses on each signal light set were eliminated as extinction trials to ensure obtaining posed reactions rather than conditioned responses. The same ordering of signals and of stimulus subjects was used for this tape as for the previous one.

In order to ensure that the subjects were fully aware of the requirements of the task, a sample of each stimulus subject's response to each signal light was included at the beginning of each final tape. These samples were drawn from the learning trials for the "Loyola" tape and from the extinction trials for the "Sir George" tape. Subjects in the experiment were told the condition depicted in each sample, i.e., expecting or not expecting shock, and were not asked to judge them.

Thus, two tapes were assembled, one consisting of genuine expressions and the other of simulated expressions, each containing a total of 40 trials taken from the same four stimulus subjects.

Procedure

All subjects were asked to participate in a psychological study that involved judging facial expressions. They were offered $3 for their assistance plus an additional $2 for good performance (all subjects who completed the task were given $5). Subjects were seen individually for the experimental procedure and the two IQ tests. Each session lasted approximately 45 minutes to an hour.

Instructions for responding to trials on the video-tape (Appendix D) were given and the lighting in the room was dimmed as for ordinary TV viewing. A Sony 12" TV monitor was used for all subjects and was placed 1.25 m from the subject on a table in front of him. Immediately in front of the subject, on the table, were two bar press electric timers, one labelled "Shock" and the other labelled "No Shock." The subject was instructed to look at each shot of a person's face and judge whether the person expected an electric shock or expected no shock; he was then to press the appropriate timer indicating his answer within a 10-second period after each shot. The experimenter stood at another table .61 m to the left of and .3 m behind the subject, and from there, switched on the timers as each shot on the video-tape ended. The experimenter then recorded the time and the answer of the subject (Shock or No Shock), and prepared the timers to start again at the end of the next shot. When the subject gave no response or a response beyond the acceptable 10-second period, the response was scored as incorrect.

A three-way analysis of variance was used for statistical analysis. At level A (diagnostic category), 24 subjects were designated normal subjects and 24 subjects were designated as patients with paranoid symptoms. At level B (type of stimuli), 12 subjects from each level A group viewed the genuine tape and 12 subjects viewed the simulated tape. At level C (sample or no sample of shock), 6 subjects from each group at level B received a single sample of the electric shock (80 volts) before viewing the tape and the other 6 subjects did not receive a sample of shock.

The two dependent variables analyzed were: (1) number of correct responses, and (2) average latency of response. Latency measures were included as a possible source of additional information.

# Results

## Analysis of Variance on Accuracy Scores

Individual accuracy scores for all subjects are listed in Appendix E. Results of the analysis of variance on accuracy scores are shown in Table 2. No overall difference in accuracy score was demonstrated on level A, between control subjects and experimental subjects. Level B demonstrated a significant difference between accuracy scores for genuine stimuli and for simulated stimuli across groups, $F$ (1, 40) = 30.74, $p < .001$. No difference in score was found at level C, between subjects receiving and those not receiving a sample of shock.

The A x B interaction of experimental-control group membership and nature of stimuli (genuine-simulated) was significant, $F$ (1, 40) = 13.66, $p < .001$. The other two double interactions were not significant, i.e., experimental-control group membership and sampling of shock, and nature of stimuli and sampling of shock. The triple interaction also was not significant.

In order to assess the significant A x B interaction, the Newman-Keuls method of multiple-comparison was applied. Ferguson (1971) selects this method as one of the best compromises between the possibilities of committing Type I and Type II errors. As indicated in Table 3, three of the four comparisons of interest proved significant: (1) patients viewing genuine stimuli were significantly more accurate than normal subjects viewing genuine stimuli, $Q$ (40) = 3.06, $p < .05$; (2) patients viewing simulated stimuli were significantly less accurate than normal subjects viewing simulated stimuli, $Q$ (40) = 4.13, $p < .01$; (3) patients viewing genuine stimuli were not significantly different

Table 2

Analysis of Variance for Accuracy Scores

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| A | 4.09 | 1 | 4.09 | .42 | n.s. |
| B | 300.00 | 1 | 300.00 | 30.74 | .001 |
| C | .09 | 1 | .09 | .009 | n.s. |
| A x B | 133.33 | 1 | 133.33 | 13.66 | .001 |
| A x C | 18.74 | 1 | 18.74 | 1.92 | n.s. |
| B x C | 3.00 | 1 | 3.00 | .31 | n.s. |
| A x B x C | 8.34 | 1 | 8.34 | .85 | n.s. |
| Within Groups | 390.33 | 40 | 9.76 | | |

Table 3

Newman-Keuls Multiple-Comparison of Accuracy Scores, Table of Q

| | I | II | III | IV |
|---|---|---|---|---|
| I | | 3.06* | 4.90** | 9.26** |
| II | | | 1.84 | 6.20** |
| III | | | | 4.13** |
| IV | | | | |

I - normal subjects viewing genuine stimuli ($\bar{x}$=21.92)

II - patients viewing genuine stimuli ($\bar{x}$=24.67)

III - patients viewing simulated stimuli ($\bar{x}$=26.33)

IV - normal subjects viewing simulated stimuli ($\bar{x}$=30.25)

*$p < .05$

**$p < .01$

in accuracy from patients viewing simulated stimuli, $Q$ (40) = 1.84, n.s.; (4) normal subjects viewing genuine stimuli were significantly less accurate than normal subjects viewing simulated stimuli, $Q$ (40) = 9.26, $p < .01$. Figure 1 presents in graphic form the mean accuracy scores compared by the Newman-Keuls method.

Correlation of Accuracy and IQ

The possibility of a correlation of accuracy with intelligence was examined. Because of the significant differences demonstrated between paranoid and normal groups on each set of stimuli (Figure 1), correlational analysis was done separately for each group: (1) patients responding to genuine stimuli, (2) patients responding to simulated stimuli, (3) normal subjects responding to genuine stimuli, and (4) normal subjects responding to simulated stimuli.

In order to obtain an intelligence score reflecting optimal intellectual functioning, both the Revised Beta Examination (nonverbal) and the Quick Test (verbal) were administered to each subject. The higher of the two scores was used in the calculation of the correlation between response accuracy and intelligence.

The small number of subjects for each set ($n$ = 11, $n$ = 12, $n$ = 12, $n$ = 12) suggested that Spearman's coefficient of rank correlation was the appropriate statistic for correlational analysis. However, the large number of tied ranks made it necessary to apply the Pearson product-moment correlational method to ranks, in accordance with the recommendation of Ferguson (1971, p. 307).

Experimental subjects responding to genuine stimuli numbered 11 rather than 12 in correlation data only. One patient in the genuine

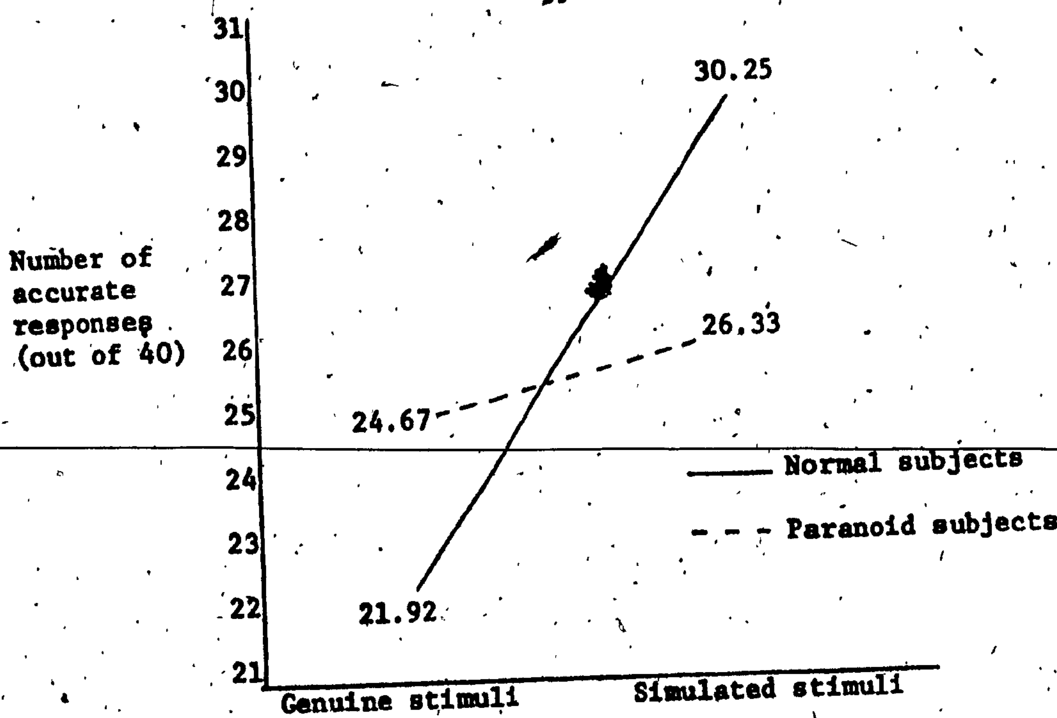


Figure 1. Mean accuracy scores showing A x B interaction of paranoid-normal groups and genuine-simulated conditions.

stimuli group was excluded from the correlational sample because treatment side effects interfered with intelligence test performance. He was eligible, however, for the experimental procedure.

Results of Pearson $r$ calculation on ranks for each of the above groups are given in Table 4. Only one group demonstrated a significant correlation of accuracy of response with intelligence; this was the group of patients responding to genuine stimuli, $r\ (9) = .625$, $p < .05$.

Latency Measures

To determine whether latency measures would support any of the findings from the accuracy scores, a two-way analysis of variance was computed on the mean latency of response for each subject. Results are given in Table 5. None of the measures was significant. Individual subjects' mean latencies are listed in Appendix F.

"No Shock" Answers

The possibility that some subjects perceived the true nature of the simulated stimuli more than others, i.e., that there really was no shock given at any time, was examined by means of the $t$ test. The number of "No shock" answers, whether correct or incorrect as to the pose, given by patients viewing the simulated tape ($\bar{x} = 18.42$) was compared with the number of "No shock" answers given by normal subjects viewing the same tape ($\bar{x} = 18.92$). The difference was not significant.

Accuracy of Student Group

Since samples of the stimulus persons were presented at the beginning of each tape to all subjects, there was the possibility that accurate judgment was the result of learning from preliminary exposure to the samples. To determine whether accuracy above chance could be

Table 4

Pearson Product-Moment Correlation Coefficients on Ranks for Accuracy and IQ

| Group | r | df | p |
|---|---|---|---|
| Patients viewing genuine stimuli | .625 | 9 | <.05 |
| Normal subjects viewing genuine stimuli | .401 | 10 | n.s. |
| Normal subjects viewing simulated stimuli | .06 | 10 | n.s. |
| Patients viewing simulated stimuli | -.23 | 10 | n.s. |

Table 5

Analysis of Variance for Mean Latencies

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| A | 1.92 | 1 | 1.92 | 2.09 | n.s. |
| B | .39 | 1 | .39 | .42 | n.s. |
| A x B | .95 | 1 | .95 | 1.03 | n.s. |
| Within Groups | 40.43 | 44 | .92 | | |

obtained by persons not exposed to the samples, a separate group of subjects was tested. The group consisted of 50 Introductory Psychology students. The genuine tape only was presented to the class as a group with the eight samples of the stimulus persons eliminated from the presentation. A $\underline{Z}$ score was computed on the obtained mean of 22.64 ($\hat{\underline{S}}$ = 3.21) and accuracy above chance was demonstrated, $\underline{Z} = 5.87$, $\underline{p} < .001$. Individual scores for the student group are listed in Appendix G.

## Discussion

The results support three of the four hypotheses tested in the study. (1) The paranoid patients proved to be more accurate than the normal subjects in judging genuine stimuli. (2) The normal subjects were more accurate than the paranoid patients in judging simulated stimuli. (3) The normal subjects demonstrated more accuracy in judging simulated as compared to genuine stimuli. (4) Finally, the hypothesis that subjects who received a sample of the electric shock before viewing the tapes would be more accurate in their judgments than those who did not was not confirmed.

These findings indicate that paranoid patients are more sensitive than normal persons to genuine nonverbal facial cues which communicate a particular stress or relief from that stress. In considering the possible reasons for this, the question arises as to whether a differential rate of learning between the paranoid subjects and the normal subjects occurred <u>within</u> the experimental situation. This does not appear to be likely for three reasons. First, the data obtained from the undergraduate students demonstrate that viewing of preliminary samples of stimulus subjects' responses is not required for subjects to achieve accurate scores. Preliminary samples were not shown to the undergraduates, but they were able to judge accurately above the level of chance. This would suggest that they already possessed a strategy or process for interpreting this type of facial expression. The student data support the inference that subjects within the study proper employed some process already within their capability.

Second, subjects were not given any feedback about their responses.

Therefore, it was equally probable that they would learn to pick up the wrong cues as the right ones. Third, it would seem logical that if learning from the samples had taken place, the two groups would have moved in the same direction towards higher or lower scores from one tape to the other. The data, however, indicate that the opposite occurred--the two categories of subjects (normal-paranoid) reversed themselves in superiority of accuracy to one another in going from genuine to simulated stimuli. These data would therefore suggest that the paranoid patient group possessed some capacity to judge genuine facial expressions denoting stress more accurately than the normal group. Further support could be obtained from a replication of the study which did not include a preliminary presentation of samples.

The simulated experimental situation, however, presents a more complex set of conditions. Here a response was scored as correct if it coincided with the intent of the pose; but this was, in fact, a distortion of reality. The real situation in the simulated presentation was one in which electric shock was never given or expected by the stimulus persons. Subjects received the same instructions for the two tapes; there was no indication that stimulus persons were posing at any time. Thus, the maximum accurate response to the true condition in the simulated tape would have consisted of 40 "No shock" answers, rather than 20 which was the maximally "correct" score possible. Under these conditions the subjects who more frequently responded with "No shock" to the simulated tape could be said to have seen more accurately through the façade to the reality of the situation.

The two subject groups, however, did not differ in this respect;

their means for "No shock" answers to the simulated tape were relatively equal. We cannot conclude, therefore, that the paranoid group was more accurate on the basis of "No shock" answers. Since they were, however, more accurate for the genuine condition, we must ask what was going on in the simulated condition to account for the reversal.

To answer this, we might examine more closely the question of what comprises an accurate answer to the simulated stimuli. It is possible to arrive at the conclusion that an accurate response to the simulated stimuli is one which allows for the subject's perception of the pose as a pose but does not expect him to conclude what is really happening. This becomes clearer if we consider the following model: should we inadvertently walk into the middle of a contemporary street drama in which one of the actors presents himself as in grief over the death of a loved one, there are three levels of perception possible to us as viewers. These levels could be said to represent increases in the subtlety and number of the cues perceived. At the first level we might not realize it is a play and believe the grief to be actually currently experienced by the person showing it. At the second level, we might pick up various cues that suggest it is a play and decide that the grief is posed. At the third level we might readily perceive that a play is in progress which includes the depiction of grief, but we might further wonder what the actor is experiencing personally beneath the pose he presents.

Thus, to the question, "What is happening here?" there are three possible answers corresponding to the three levels of perception: (1) we might answer, "A man is grieving;" (2) we might answer, "A man is acting an experience of grief;" (3) we might answer, "I don't know--the situation is not really what it appears to be," or "I can't choose a single answer; there is more than one thing happening here." There is, theoretically, a fourth possible level of perception and response; one at which the viewer does actually perceive and label the personal state of the actor; e.g., "This man is terribly anxious to put on a good show, perhaps to land a job." That would be comparable to our subjects' giving 40 "No shock" answers to the simulated tape and probably represents an extraordinary degree of perceptiveness.

Given these considerations, the normal subjects may be said to have responded to the simulated stimuli at the above-mentioned first or second level of perception, the relative face value of the situation. This increase in accuracy shown by normal subjects for posed over genuine stimuli is consistent with the findings of Gottschaldt (cited in Frijda, 1969). We cannot conclude, however, that the paranoid subjects picked up fewer cues than the normal subjects in the simulated situations, since they were more accurate than normal subjects for genuine stimuli. Also, Kar (1967) found that acute reactive paranoid schizophrenics were able to recall more distracting elements than normal subjects in an illusion figure experimental task. An interpretation consonant with his results and with those for the genuine stimuli in this study is that the lower scores obtained by the paranoid patients on the simulated tape represent their perception at the third level in our model. In effect, the reversal of higher accuracy for the two groups from genuine to simulated stimuli is the result of the third level "I don't know" or "I cannot say" kind of response from the paranoid group.

In this situation, the patient's response could be translated in general terms as, "I know things are not really what they appear to be, but I don't know or may not say what they really are." The first clause of this statement suggests the sensitivity to nonverbal cues and the second clause suggests difficulties with functioning. Watzlawick, Beavin, and Jackson (1967, p. 213) have noted the schizophrenic's difficulty with the "discrepancy between what he does see and what he 'should' see." Our data indicate that the normal person does not suffer with this dilemma, or at least not to the same degree; the normal subjects accepted the façade.

This interpretation ties in with Helfand's findings (1956) of greater empathy on the part of schizophrenics with hospital privileges as compared to normal persons. The normal person appears to have learned acceptance of the face value of communications. The findings of Bugental, Kaswan, and Love (1970) support the inference that normal persons have learned to respond to a social façade. They report that when presented with posed, conflicting messages containing a positive statement and a negative statement, children interpret them more negatively than do their parents. Truax and Mitchell (1971) have commented, "As we have all learned in life, people are not always what they seem. All of us have been conditioned from childhood to present social façades so that we often say in a polite manner when we are insulted or hurt and are asked about it, 'Oh no, that doesn't matter.'" The capacity to empathize requires seeing through this "defensive screen or social façade" (p. 317). This may well be what paranoid patients are able to do.

Support for this interpretation is found in the work of a number of researchers examining nonverbal communication using the experimental paradigm originated by Miller (1967) in his work with monkeys. Buck, Miller, and Caul (1974) and Buck, Savin, Miller, and Caul (1969, 1972) found a negative correlation between accuracy of sending, or expressiveness, and physiological responsivity as indicated by skin conductance and heart rate acceleration. This, they noted, was consistent with Jones' (1960) distinction between externalizers and internalizers, the former describing persons exhibiting a high degree of overt emotional expression and low skin conductance response, with the reverse correlation for the latter. Further, Buck, Miller, and Caul (1974) found that subjects who were categorized as internalizers on the basis of their low level of expressiveness of nonverbal cues and their high physiological response were also found to score as "sensitizers" on the Byrne (1961) Repression-Sensitization scale.

It becomes possible to place the subjects of the present study in the categories described above when we consider the findings of Lanzetta and Kleck (1970). They found, contrary to their expectations, that those subjects whose facial expressions were most often judged accurately by others, were themselves the poorest judges of other persons' expressions. The reverse also was true, i.e., those whose expressions were most difficult for others to judge or who were more controlled, were themselves the best judges of the expressions of others. The implications of this, then, for the present study are that the paranoid patients, being high in accuracy of judging the facial expressions of others, would also prove to be low in accuracy of nonverbal sending (lacking in visible affect), high in physiological responsivity (these last two points taken together placing them in the category of internalizers), and also sensitizers. Conversely, normal subjects, by comparison, would be expected to score as externalizers and repressors. Should the last point be demonstrated experimentally, it would serve as confirmation of our inference that normal persons acquire an acceptance of social façade or a blunting of alertness to nonverbal, emotional cues, while paranoid persons acquire or retain a sensitivity to them.

The explanation postulated by Buck, Miller, and Caul (1974) to account for their findings is consistent with our hypotheses. They suggest that social learning experiences can account for the correlation of inhibited overt expression with increased physiological responding. If, they suggest, a person has learned in childhood that emotional expressiveness on his part will receive rebuke, the rebuke may be the factor that has produced the higher physiological response; i.e., a stress factor, the rebuke, sets up the association of overt emotional inhibition with high physiological responsivity. We might add that such a rebuke could be communicated in conflicting messages and serve as a stress factor producing inhibition of overt emotional expression (flattened affect) and increased physiological responsivity, features which are characteristically associated with schizophrenia. Useful information could be gathered from studies exploring these questions.

## Proposed Modifications and Extensions of the Study

The present study was, by necessity, limited in focus and scope.

The results, therefore, raise a number of questions which might be clarified by modified replications or extensions of the study. The possibility of experimenter bias operating as an influence on the present findings should be considered. A rigorous double-blind procedure would be necessary, involving the use of a research assistant who administers the procedures but does not know the hypotheses and aims of the experiment. Certain considerations lead us to believe, however, that if experimenter bias was a factor in these findings, its effects were minimal. First, the experimenter was careful to remain out of the subject's field of vision during the viewing of the video-tape. Second, despite major differences in test conditions, hypotheses, and procedures, the mean accuracy scores of the undergraduates and the normal control subjects were comparable for genuine stimuli.

Detailed study of response latency was also beyond the scope of the present investigation. Reliable measurement of response latency requires the use of automated rather than manually operated timing switches. It can also be argued that analysis of latency data requires the use of median rather than mean scores, since the latter procedure tends to give undue weight to the extreme response latencies. Such an examination might shed more light on the nature of the relationship between facility of response and the genuinness/simulatedness of the stimulus material for patients and normal persons.

Another modification of the study would provide more rigorous data from which to determine whether normal persons accept a façade with awareness that it is that, or whether they take the façade for reality. This could be done by developing material in which genuine and simulated stimuli are mixed and presenting subjects with the task of distinguishing which are genuine and which are simulated. Similarly, more information about the patients' difficulty with the poses might be obtained from this kind of task.

The scope of the present study should also be extended in order to determine the generalizability of the findings. It would be useful, for example, to study several patient groups along with a normal group in order to conclude whether these results apply to paranoid patients only. Similarly, the sampling of other types of emotional expression should be done. The same subject groups might be presented with material related to other types of emotional expression to determine whether the paranoid patients' sensitivity is specific to particular types of expression or covers the broader range of emotional expression.

Finally, it should prove useful to replicate and extend the series of correlative studies initiated by Buck, et al. in which personality, behavioral, and physiological variables are identified which correlate with high or low accuracy in sending or receiving nonverbal messages, in both normal and patient groups. One of the variables that could be investigated is intelligence. In examining the relation of intelligence with accuracy in the present study, patients viewing genuine stimuli demonstrated a significant correlation, but the other three groups did not (Table 4). These results suggest that further examination of the question should be undertaken.

## Implications of the Study

A review of the literature reveals few studies which hypothesize and demonstrate a level of competence among a patient group above that of the normal group. Exceptions to this are Helfand (1956), Rogers, Gendlin, Kiesler, and Truax (1967), and Kar (1967), who did not hypothesize but found a degree of accuracy in the patient group above that of the normal group. It would be valuable both for our understanding of abnormal behavior and for the improvement of research methodology, to examine the possibilities of other areas of credit (vs. deficit) performance on the part of patients. If such other skills can be found, basic questions concerning our views of abnormal behavior and the purposes, and therefore the methodology, of research might be raised.

For example, what losses are suffered, in the realm of interpersonal understanding and elsewhere, to a society in which adequate social functioning (behavior which is rewarded) is maintained by means of acceptance of a social façade? What is the role of a clinician vis à vis a patient whose perceptions are more valid than those of the normally functioning society that has labelled him as one "out of touch with reality?" What have been the guiding principles that have led psychological researchers to design studies that have resulted only in the demonstration of deficits in performance by patient groups? Is there a mythology of modern society, revealed in its various façades, that the psychological researcher has the role of supporting with scientifically developed data?

The study suggests several points for consideration in clinical practice. The first general and practical inference to be drawn from the results is that whenever a paranoid patient states a perception that appears unreal or distorted to others, the listeners can assume that it is in some way valid and that there may be something in the situation described by the patient that the listener has missed. Of particular importance is the need for therapists to question the appropriateness and benefit to the client of following the conventional approaches with paranoid patients, e.g., extinguishing delusional thoughts, punishing them, or interpreting them as projections of the patient's own hostile feelings. The therapist should consider instead the need to validate the patient's perceptions. Obviously we are not referring here to a literal interpretation of perceptions that are clearly expressed in a symbolic form. For these, the therapist simply must draw on his imaginative, poetic powers for understanding of the patient's expressions, and then must help the patient to recognize the reality that the image refers to.

For example, a patient may claim that members of his family are trying to poison him. He can be helped to see that what he perceives accurately is that those members are indeed presenting a threat to him and are inimical to him, but in covert ways that they require him not to recognize in order that they might present themselves as benevolent persons. If, on the other hand, the patient's valid perceptions are denied or indirectly rejected by the therapist, the effect would be that the therapist, like the family, sets the patient at odds with himself, thereby continuing the conditions which elicit disturbed behavior.

In ward settings or in group work, clinical workers could learn to listen to and to ask for the paranoid patients' perceptions of the emotional tone of interpersonal interactions. This would serve not only to validate the patients' perceptions and provide accurate information, but would also build patient self-esteem and active control over their own lives through valued participation in the therapeutic program.

The data from the present study also raise questions concerning the selection and training of therapists. If patients are particularly sensitive to discrepancies between the verbal and the nonverbal channels, it is important for therapists to be consonant across the two channels in their communications to patients. The influence of therapists' nonverbal messages upon patient performance has been demonstrated by Trattner and Howard (1970). They found that different kinds of therapists had differential effect communicated nonverbally upon the performance of patients in an experimental task. The possibility of training therapists to be aware of these communications requires study. Should such training prove to be not possible or practicable, the question then becomes one of selecting only those persons who already possess an adequate degree of consonance in their communications for the work of therapy.

Finally, in regard to psychological research in general, the data from this study indicate that it is invalid to apply generalizations based on simulated situations to naturally occurring events. We have seen that subjects respond quite differently to genuine and to simulated stimuli, and different groups respond to the kinds of stimuli in different ways. Perhaps, for example, Schachter and Singer (1962) might have obtained very different results, in regard to the behavior of their subjects, had their subjects been exposed to persons truly experiencing anger or euphoria. Similarly, Milgram (1963, 1965) might have obtained very different results had he not used simulation. The only conclusions that can be drawn from studies employing this kind of simulation is that subjects respond with the demonstrated behavior to a simulation of the situation presented to them.

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## Appendix A

### Instructions to Stimulus Subjects for Genuine Tape

I'd like you to sit in this chair in a comfortable position while you look at these lights, and keep that position throughout testing. Later, we're going to video-tape your face; but before that, we'll go through a series of preliminary trials in order to make whatever adjustments are necessary for your individual response. I'll focus the camera now so we can carry on without interruption.

In order to get a set of conditions as individualized as possible, suited to your own particular reactions, I'd like you, during this preliminary series, to be as natural as possible. Don't try to assume any reaction that you think I might want. We need your own, personal, spontaneous response. That will allow us to get the best results later when we make the video-tape.

This is where the shock will come--on your fingertips. The only limitations are that we cannot converse during testing because I will be timing the series very carefully; and you must sit in the same position in the chair with your hands in your lap throughout the series. Otherwise be as naturally yourself as possible.

Just look at these two lights the whole time. I'll turn them on one at a time, sometimes the red light, like this, and sometimes the white light, like this. Each time the light will be on for 6 seconds. If the white light has been on, after the 6 seconds nothing will happen. But if the red light has been on, at the end of the 6 seconds you'll get a shock, like this--ready? At some point in the series I'll increase the level of shock, but I won't tell you when that will be.

All you have to do is watch the two lights the whole time. And remember, be your natural self. Do you understand?

## Appendix B

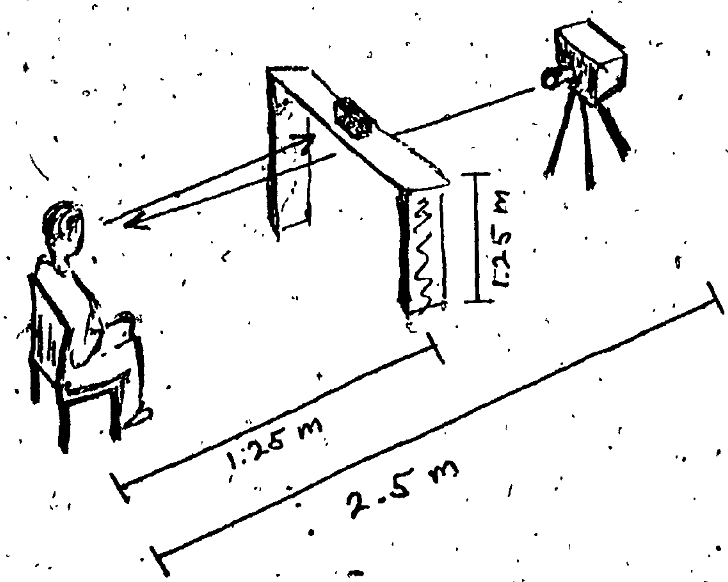
Instructions to Stimulus Subjects for Simulated Tape

Now through this series there'll be no shocks at all. I'll simply switch on one or the other of the lights for 6 seconds each time, as before; but nothing will come after the 6 seconds for either of the lights.

What you must do now is pose, act, as well as you can, a situation in which you do get shocks, as the series we just went through. Other persons are going to look at the video-tape we're making now of your face, and they will believe that on some trials you are looking at a red light indicating shock to follow, and that you really do get the shock when the red light goes off; and that on other trials you are looking at a white light indicating no shock to follow. You must communicate to them, by your facial expression, which light it is each time. Do this, by your facial expression alone, in whatever way you think will be most discriminating and convincing. Please try to remember that we are especially interested in your facial expression at the time that the light is on, that is, you must show what you expect to happen when the light goes off so that someone looking only at your face can determine that on some trials you expect a shock to come and on other trials you do not expect a shock to follow. You may also pose actually getting the shock following the red light, since that might help you pose the expectation of it. I'll tap my pen to signal the moment when the shock would come, like this. I will also advise you when the shock level has supposedly been increased. Do you understand?

## Appendix C

Diagram of Video-Taping Arrangement



## Appendix D

### Instructions to Subjects of the Experiment

I'm going to show you a video-tape that lasts about 20 minutes. Each of the four people you will see on the TV, one at a time, went through a series of trials. At each trial the person saw a light on for 6 seconds, either a red light, like this, or a white light, like this. He knew that the red light indicated electric shock would follow immediately after the 6 seconds that the light was on; it was administered to the fingertips, like this. (Sample for those who are assigned to that group) And he knew that the white light indicated that no shock would follow.

I want you to look at the video-tape and guess as accurately as you can, each time you see a person's face, which light he sees, one indicating shock would follow or one indicating no shock would follow. You'll give your answer by pressing one of these timers once only; you don't have to say anything. You'll have 8 seconds after the face goes off the screen to give your answer; at the end of those 8 seconds my voice on the video-tape will say "Stop" and you can't give an answer after that.

Be sure to look at each face for the full 6 seconds--you don't want to miss anything that might come at the end. Don't look at me at any time while the TV is on, but watch the screen the whole time except for pressing the timers for your answers. We may not talk to each other, either.

All the trials you will see are different. You will never see anyone getting a shock but only expecting or not expecting it. The tape begins with a sample of each person in each situation. You will begin your guessing when "Number one" is announced.

## Appendix E

### Individual Accuracy Scores for Paranoid and Normal Control Subjects

| Normal Subjects | | | | Paranoid Subjects | | | |
|---|---|---|---|---|---|---|---|
| Genuine Stimuli | | Simulated Stimuli | | Genuine Stimuli | | Simulated Stimuli | |
| Sample of Shock | No Sample of Shock | Sample of Shock | No Sample of Shock | Sample of Shock | No Sample of Shock | Sample of Shock | No Sample of Shock |
| 21 | 23 | 33 | 24 | 22 | 26 | 20 | 16 |
| 23 | 20 | 35 | 31 | 23 | 25 | 30 | 29 |
| 22 | 23 | 28 | 33 | 21 | 25 | 28 | 26 |
| 22 | 21 | 28 | 30 | 26 | 23 | 25 | 28 |
| 26 | 17 | 27 | 30 | 24 | 29 | 29 | 29 |
| 22 | 23 | 33 | 31 | 24 | 28 | 26 | 30 |

## Appendix F

### Individual Mean Latencies for all Subjects

| Control Subjects | | Experimental Subjects | |
|---|---|---|---|
| Genuine Stimuli | Simulated Stimuli | Genuine Stimuli | Simulated Stimuli |
| 1.25 | .73 | 1.42 | .56 |
| 1.90 | 1.29 | 1.65 | 2.65 |
| 3.58 | .25 | 1.46 | .77 |
| 2.87 | 1.40 | .87 | .36 |
| .77 | 1.10 | 1.37 | 1.07 |
| .60 | .76 | 1.56 | 2.50 |
| 2.72 | .51 | 1.92 | 1.59 |
| 1.75 | 2.14 | 2.88 | .86 |
| 1.30 | 1.02 | 2.27 | .66 |
| 1.06 | 2.38 | 1.77 | 1.82 |
| .46 | 1.39 | 1.49 | 4.22 |
| .61 | .36 | 1.61 | 4.46 |

## Appendix G

### Accuracy Scores of Introductory Psychology Students

| Frequency | Score |
|---|---|
| 1 | 30 |
| 2 | 29 |
| 8 | 26 |
| 1 | 25 |
| 9 | 24 |
| 6 | 23 |
| 7 | 22 |
| 4 | 21 |
| 1 | 20 |
| 4 | 19 |
| 5 | 18 |
| 1 | 17 |
| 1 | 16 |

## Appendix H

### Criteria for Selection of Paranoid Subjects

Experimental subjects were selected on the basis of symptoms demonstrated by Venables and O'Connor (1959) to distinguish paranoid schizophrenia from other types of schizophrenia. These were: delusions of grandeur, delusions of persecution, delusions of external control, and ideas of reference. Recorded staff reports of specific patient statements revealing any one or more of these symptoms was taken as evidence of a delusional system. Statements which could have a factual basis, e.g., attempts at control by parents or family, were discounted and only those accepted which could not under any circumstances have a factual basis, e.g., the CIA, the Mafia, and the Catholic Church are conspiring together to control my thoughts.