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Sensitivity to nonverbal communication among schizophrenic subtypes.

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Sensitivity to Nonverbal Communication Among Schizophrenic Subtypes

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Steven E. Weinstein

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This thesis is submitted in partial fulfillment of

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Table of Contents

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LIST OF TABLES

ABSTRACT

The present study was an attempt to investigate differences in the decoding (interpretation) of nonverbal cues between schizophrenic subtypes. Nonverbal sensitivity was used as an indicator of the subject's interpersonal skills. Nonverbal communication was studied in 16 paranoid-reactive and 16 nonparanoid-process male and female subjects, using the PONS (Profile of Nonverbal Sensitivity). Based on previous studies, four hypotheses were made. First was the hypothesis that paranoid-reactive patients would be more accurate at identifying nonverbal cues. This hypothesis was confirmed. The second hypothesis was that paranoid-reactive subjects would increase their decoding accuracy with the addition of channels. This hypothesis was not confirmed. Instead, it was found that both groups performed significantly less accurately with the addition of cues. The third hypothesis was that the nonparanoid-process group would perform better on the audio cues and that the paranoid-reactive group would be more accurate on the visual cues. This hypothesis was only partially confirmed. The nonparanoid-process group was not more accurate with audio cues; but the subjects in the paranoid-reactive group did perform significantly better with visual cues. Finally, the fourth hypothesis predicted that the nonparanoid-process patient would be more accurate with positive-submissive scenes than with negative-dominant scenes. The paranoid-reactive subjects were predicted to be more accurate in decoding dominant affect scenes than submissive affect scenes. The final hypothesis was not confirmed for the nonparanoid-process group but was confirmed with the paranoid-reactive group. All subjects performed significantly better on the dominant affect scenes. In all analyses, no gender differences were found. The significance of the results found in the present study, as well as implications for therapy and further research, are discussed.

Sensitivity to Nonverbal Communication Among Schizophrenic Subtypes

INTRODUCTION

One cannot consider the development of personality and exclude the influence of relationships with others. Leary (1957) stated: "The most functional aspects of human behavior seem to be interpersonal. To understand a human being is to have probability evidence about his relationships to others." (p. 18). One of the earlier theorists who emphasized interpersonal behavior as the basic level for psychological theory was Harry Stack Sullivan. According to Sullivan, an individual's personality develops through interactions with others. Sullivan believed that personality development involves the progression through various stages of interpersonal relations. Failure to progress through these stages will result in later maladaptive behavior.

Sullivan (1956) viewed mental disorders as extensions of normal prototypes. He believed that individuals with these disorders manifest interpersonal patterns that are not qualitatively different from those of any other person. He notes that what we find in schizophrenic individuals are personality characteristics which everyone experiences in early stages of personality development. The only difference between people with mental disorders and "normal" individuals is the tendency for "normals" to encounter "schizophrenic" experiences only in dream-like states or in attacks of anxiety.

In addressing the dynamics behind schizophrenic thought processes, Sullivan introduced the concept of dissociation. Dissociation can be described as a separation between thought and feeling. Similar to the Freudian

concepts of repression and the unconscious, dissociation involves aspects of personality which are denied access to awareness. Sullivan (1962) stated that schizophrenic persons are those individuals who, because of a dissociation in the mental aspects of their life processes, are no longer able to relate to others in an ordinary way. He argued that progress in the understanding and prevention of schizophrenia will not take place "until an extensive revision of prevailing conceptions is made in the direction of an increased attention to super-personal or social factors in human life" (p. 186).

Cameron and Magaret (1961) and Cameron (1963), although to a lesser extent than Sullivan, also emphasized the interpersonal nature of mental disorders. These researchers discussed schizophrenia as a failure to learn the appropriate role-taking behavior. Cameron has stated: "schizophrenic reactions are regressive attempts to escape tension and anxiety by abandoning realistic interpersonal object relations and constructing delusions and hallucinations" (p. 584). He further stated that the schizophrenic person's problems arise from difficulty in differentiating the self from others, particularly the mother.

The notion that schizophrenia may be caused by a distortion in the interpersonal communication process between mother and child was set forth in the double bind theory (Bateson, Jackson, Haley, and Weakland, 1956). The general characteristics of a double bind situation are described as follows: First, the child is involved in an intense relationship with the family in which it is imperative that the child attempt to understand what sort of messages are being sent in order to make the appropriate response. Second, the child is sent messages in which the verbal (content) and the nonverbal (gestures, tone, etc.) components contradict each other. Finally,

the child is unable to comment on this message contradiction in order to know which message to respond to. If an individual spends his life in a double bind relationship, relating to other people after a psychotic break will be especially difficult. His nonverbal communication system would have broken down, and he would have trouble in discriminating nonverbal messages being sent to him.

Although investigators (i.e., Sullivan, 1962, Cameron and Magaret, 1963, and Bateson et al., 1956) hypothesize a deficit in interpersonal communication among schizophrenic individuals, a problem in their theories lies in the difficulty of systematically testing them. According to Haley (1963), "an ideal classification of interpersonal relations would indicate types of psychopathology, or differentiate relationships into classes, according to the presence or absence of readily observable sequences in the interaction" (p. 87). Thus, Haley believes that different groups of schizophrenics may be classified in terms of different patterns of communication.

One possible method of classification of different patterns of communication is in the measurement of an individual's ability to interpret nonverbal cues. The reason for using a measurement of nonverbal rather than verbal cues is that many researchers (e.g., Argyle, 1975, Mehrabian, 1972, and Giffin and Patton, 1971) believe that the nonverbal portion of a message is given more weight when verbal and nonverbal components conflict. Lidz (1973) also believes this to be true for the schizophrenic individual:

> ...because the patient had learned to disregard what is said, the unspoken signals are of great importance...They have learned to base their interactions with parents on indications, and to become skilled in responding to feelings...However, despite such abilities or because such abilities are based upon relationships with peculiar parents,

schizophrenic patients often misinterpret. (pp. 104-105)

The key to understanding the interpersonal nature of schizophrenia may thus lie in attempts at describing the schizophrenic person's ability to decode nonverbal cues. Before examining previous research on the interpretation of nonverbal cues by schizophrenic patients, the foundations of such research (conducted with normal persons) will be discussed.

The measurement of an individual's ability to decode nonverbal cues probably began with Charles Darwin. In his book The Expression of Emotion in Man and Animals (1872), Darwin attempted to study the reliability of interpreting facial expressions.

Since Darwin's informal decoding study, much interest has been taken in the expression of emotion, and many researchers have continued investigations in the decoding of facial cues. In the past, most decoding studies used still photographs. Pictures of facial expressions were presented, and subjects were asked to identify the emotion in the photograph. Results were then analyzed to determine whether or not the subject had accurately identified the emotion portrayed in the photograph. Knapp (1972), and Gitter, Black and Mostofsky (1972) found that films and videotapes produced a much higher level of decoding accuracy than still photographs.

Body and audio cues have not been used as extensively in deecoding research as facial cues. Research using body cues has been mainly concerned with one or more of the following behaviors: hand and arm gestures, body positions, and posture and body movements. Studies using audio cues have usually involved one of three strategies: standard content readings expressing different emotions, using foreign language unknown to the decoders, and using special techniques to create content-free speech (Rosenthal, Hall, DiMatteo, Rogers, and Archer, 1979b).

Most decoding studies have been limited to the use of a single channel of communication. Studies which have used more than one channel usually investigated whether or not a particular channel, such as the face, is easier to decode than the body (e.g., Ekman, 1965). Rosenthal, Hall, Archer, DiMatteo, and Rogers (1979a) recognized the need for a standardized measure of decoding nonverbal cues on more than one channel of communication. They developed the Profile of Nonverbal Sensitivity (PONS), which uses videotaped segments to relay various channels of nonverbal communication. In terms of reliability, the PONS has an internal consistency of .86, as measured by the KR-20, and a retest reliability of .69 (Rosenthal et al., 1979b).

In terms of validity, Rosenthal et al. (1979a) report that the criterion validity coefficients obtained in the PONS research fall around .30. In addition, the correlations of PONS scores with potentially confounding variables such as IQ scores are sufficiently low.

The PONS, however, is not without its limitations. An attempt was put forth by the authors to make the PONS both a reliable measure of decoding in each channel and representative of "real-life" behavior. Rosenthal et al. felt that it was probably not possible to fully obtain both of these at the same time. Some of the more important criticisms will be mentioned here; but a more comprehensive evaluation of the PONS may be found in Rosenthal et al. (1979a, b).

One criticism of the PONS might be that only one encoder (portrayer) was used. Rosenthal et al. (1979a) noted that good decoders are not only likely to be more accurate at decoding with a single encoder but with many encoders as well. In addition, Rosenthal, Hall, and Zuckerman (1978) found no differences in using one encoder in many scenes and several encoders in fewer scenes. Using a female encoder rather than both male and female

encoders has been criticized for gender bias. However, Hall (1978), in a review of 19 decoding studies, did not find any gender differences in terms of the encoder used.

One of the groups studied by Rosenthal et al. (1979a) using the PONS, and one which is of major concern to the present study, is psychiatric patients. A summary of their major findings is as follows:

1) Psychiatric patients consistently scored below the level of normal subjects, indicating that they were less accurate at assessing nonverbal cues.
2) Psychiatric patients were significantly less able than normals to gain from the addition of nonverbal channels, indicating that they were less able to benefit from information from more than one channel at a time.
3) As opposed to normals, higher accuracy was obtained on the audio channels than on the visual ones.

The fact that psychiatric patients are less accurate at identifying nonverbal communications supports the point of view that these disorders might be, at least in part, interpersonal in nature.

One of the shortcomings of Rosenthal et al.'s research with a psychiatric population is that all patients were grouped without regard to diagnosis. Even among schizophrenic persons, who comprise the majority of hospitalized psychiatric patients, large differences exist among the subtypes. It would not be enough to show that schizophrenic persons as a group performed more poorly on the PONS, since they tend to do worse on most tasks when compared with normals. An examination of the performance of different subgroups of schizophrenic persons on the PONS might provide us with more information on the nature of interpersonal communication in schizophrenic populations.

Bleuler (1911/1950) noted, in referring to schizophrenia: "For the sake of convenience I used the word in the singular although it is apparent that the group includes several diseases" (p. 8). Some of the more recent literature has advocated the abandonment of investigations of schizophrenia as a group. As an alternative, it has been proposed that it is more meaningful, in terms of cognitive and emotional differences, to have schizophrenic persons under study classified according to shared dimensions: paranoid, acute-chronic, and good-poor (process-reactive) premorbid adjustment (Silverman, 1964 and Venables, 1964).

Cromwell (1975) notes that the process-reactive dimension has generally been considered the best single indicator of prognosis in schizophrenia. Johannessen, Friedman, Leitschub, and Amons (1973), upon investigation of all four dimensions, concluded that the good-poor premorbid (process-reactive) and the acute-chronic dimensions are essentially the same and that the paranoid-nonparanoid dimension is independent of the rest. Shean (1978) also noted that differences between the process-reactive and paranoid-nonparanoid dimensions seem to provide the best potential solution to the confusion involved in schizophrenia research.

Numerous differences have been reported between paranoid and nonparanoid schizophrenic persons and between schizophrenic individuals with good and poor premorbid adjustment. For example, on the paranoid-nonparanoid dimension, Payne (1961) found paranoids to be superior in intelligence to non-paranoids. Also, differences in attentional processes have been discussed by Silverman (1964) and McGhie, Chapman, and Lawson (1965). In terms of the premorbid dimension, distinctions between these two categories have also been found, such as psychological deficit differences and differing responses to major tranquilizers (Chapman and Chapman, 1973).

The criteria for determining classification on the acute-chronic dimension, unlike the paranoid-nonparanoid and process-reactive dimensions, are usually highly unreliable. This procedure requires classifying the patient in terms of when he/she was first officially diagnosed as schizophrenic. The criteria of this dimension, therefore, depend upon when the individual was first brought to the attention of a doctor. Many research studies have broadened the classification terms such that the acute dimension is defined as being hospitalized less than three years and the chronic dimension as being hospitalized more than six years. The distinction between the two dimensions is made difficult by the poor reliability of clinical diagnoses and by the problems encountered in ascertaining the onset of the illness. The process-reactive and paranoid-nonparanoid dimensions, however, are assessed independently of official diagnoses.

The present study will thus investigate the relationship between paranoid and premorbid dimensions and sensitivity to nonverbal cues. Since Zigler and Levine (1973) reported a high correlation between the paranoid-nonparanoid and the premorbid dimensions in state-hospitalized schizophrenic patients, these dimensions were combined to form the two experimental groups in the present study. Thus, paranoid-reactive and nonparanoid-process patients were studied. The following hypotheses are based on these two groups.

Overall, it was predicted that the nonparanoid-process group would be less accurate in decoding nonverbal cues. LaRusso (1978) found paranoid patients to be even more sensitive than normals to genuine nonverbal cues that communicate a stress or relief from that stress. Further support for this hypothesis comes from a study conducted by Weinstein (note 2). A patient diagnosed as schizophrenia, paranoid type stated the following when asked about delusions of persecution:

> All my paranoia does is help me to communicate with people. I can read people's facial expressions and hear their voice tones and my ears can discriminate between their voice tones to see friendship from enmity in them.

In addition, Chapman and Chapman (1973), in a review of the literature examining the process-reactive dimension, found that process schizophrenic persons performed more poorly on most tasks (e.g., problem-solving, learning abstract responses, proverb interpretations, and word associations).

It was hypothesized that the paranoid-reactive group would also profit more, in terms of decoding, with the addition of channels. The addition of channels on the PONS involves the decoding of cues from two modalities. Meisleman (1973) found that when cues from two modalities (auditory and visual) were employed in a task, chronic nonparanoid schizophrenic individuals appeared to perform the most poorly. Even when presented with competing stimuli, McGhie (1973) found that paranoid patients had no difficulty in fixating their attention. In fact, he found that the paranoid subjects were even less distractible than normal controls on most tests.

Rosenthal et al. (1979b) explored underlying dimensions of nonverbal sensitivity by a principal component analysis, in order to group samples on the basis of similarity of PONS profiles. They found three factors: non-American--American, masculine-feminine, and unsophisticated-sophisticated groups. The strongest factor was the unsophisticated-sophisticated dimension. Unsophisticated subjects were characterized by high scores on the audio scenes and low scores on the video scenes. The sophisticated group, on the other hand, had high scores on video and low scores on audio scenes. The sophisticated dimensions included the college and professional

samples. The unsophisticated sample included children, exotic (foreign) groups, and psychiatric patients. Rosenthal and his colleaques make the "tentative" conclusion that the process of socialization results in a relative disadvantage of interpreting audio cues. Using this tentative conclusion, it was predicted that the nonparanoid-process group would perform significantly better on the audio cues, while the paranoid-reactive group would perform better on the visual cues.

The rationale for the above hypothesis is that in terms of development, the process patient can be viewed as being less socialized. This patient's pre-psychotic personality, as described by Garmezy (1970), is a "poorly integrated one revealing markedly inadequate behavior in the sexual, social and occupational areas; trends to social isolation and a lack of emotional responsibility to others are clearly evident" (p. 35).

A reactive patient, on the other hand, is described by Wiener (1958) as follows:

> From birth to fifth year, the maturational and developmental history showed no defects, physical health was good. Parents were accepting. Heterosexual relationships were established. The patient had friends, and domestic troubles did not disrupt his behavior. The onset of the illness was often sudden with a clear-cut understandable precipitating event...(p. 158).

A reactive patient can thus be described as experiencing a relatively normal socialization process until the time of illness. It is likely that these individuals, who have been successfully involved interpersonally, have retained some of their skills gained prior to the onset of psychosis. As a result, the nonparanoid-process group, who is less socialized, should perform significantly better on the audio cues.

The 20 scenes of the PONS were divided by Rosenthal et al. (1979a, b) into two dimensions of affect: positive-negative and dominant-submissive. Rosenthal et al. (1979b) have also found that individuals falling in the "unsophisticated" dimension performed much better than those in the "sophisticated" dimension on scenes showing positive-submissive affect. Thus, continuing with this notion that the nonparanoid-process patients are less socialized, they were hypothesized to perform significantly better on the positive-submissive scenes than on the negative-dominant scenes. Additional support for this prediction is provided by Weinstein (note 2), using Lorr, Klett, and McNair's (1963) Inpatient Multidimensional Psychiatric Scale (IMPS) and Leary's (1957) Interpersonal Check List. Paranoid projection (as measured by the IMPS) was significantly negatively correlated with the self-effacing, masochistic interpersonal type (r = .59) which presents a predominately submissive theme. This indicated that the more paranoid the patient, the less submissive he/she viewed him/herself. Thus, paranoid patients, seeing themselves as more dominant, are hypothesized to see others in the same light and thus be more sensitive to dominant cues.

In all hypotheses, each sex was analyzed separately. This was done since it had been found by Rosenthal et al. (1979b) that females are more sensitive than males to nonverbal cues (at least among normal groups).

There is one potentially confounding variable which required measurement and subsequent analysis. This was in the area of attention. Differences in attentional processes between the two experimental groups used in the present study have been found by many researchers. Many of these studies are reviewed by Cromwell (1975). DiMatteo and Hall (1979) found, among normal persons, that accuracy and attention were highly correlated in the video channels of the face and body. A low correlation was found between

attention and voice channels. The low correlation in the video portion, as explained by these researchers may be due to a lower reliability for voice on both tasks. A visual and auditory measure of attention was thus employed in the present study, for the purpose of measuring possible deficits among the groups.

METHOD

Subjects

Subjects were 37 patients in residence at Eastern State Hospital in Williamsburg, Virginia. All subjects had a diagnosis of schizophrenia. Five subjects did not complete the entire experiment, either because they chose to discontinue participation or because they were discharged from the hospital before the experiment was over. Of the remaining 32 patients who completed the entire experiment, 16 patients fell into the paranoid-reactive group and 16 fell into the nonparanoid-process group. Each of these groups consisted of eight males and eight females.

Participation was voluntary, and subjects were informed that they could leave the experimental situation any time, if they so desired. In order to insure confidentiality, subjects were assigned a code number. The subject's name, which was only used on the consent form, was separated from the rest of the test data.

Measures

Profile of Nonverbal Sensitivity (PONS). The PONS (Rosenthal et al. 1979a, b) is a 47-minute, black-and-white videotape. It consists of 220 auditory and visual segments lasting two second each. The test is arranged so that 20 short scenes, portrayed by a woman, are presented in random order along 11 "channels" of nonverbal communication which are described below.

A brief description of the construction of the PONS is as follows: The female portrayer acted out each scene by interacting spontaneously with a person off camera. She performed each scene three times. A panel of eight judges (who knew her) rated each scene on three dimensions (friendliness, dominance, and intensity of feeling). Scenes were also judged by the same

people for authenticity. The best overall scenes were taken and categorized on the four quadrants: positive-negative and dominance-submission. Finally, five of the scenes which obtained the best ratings were selected from each of the four quadrants.

The subject's assignment is to view the videotape and, for each segment, circle the label that correctly identifies the scene just presented. The test taker has a choice between two alternative labels for each scene (see Appendix A). A pause in the tape is followed by each segment so that the test taker's decision may be made and recorded.

The 11 channels of the PONS are a combination of various kinds of auditory and visual information sent by the portrayer. The tape consists of five "pure" channel scenes and six "mixed" channel scenes (which are produced by combining one of the audio channels with one of the visual channels). The five pure channels are as follows:

1) Face alone, no voice
2) Body (from neck to knees), no voice
3) Face and body down to thighs (face plus body or figure), no voice
4) Electronically content-filtered voice, no picture
5) Randomized spliced voice, no picture

The electronically content-filtered voice was produced by removing selected bands of frequencies and clipping the audio signal so that the voice sounded distorted and muffled. The randomized spliced voice was produced by cutting the tape into one-inch segments and then randomly reassembling it. The six mixed channels are as follows:

1) Face and randomized spliced voice
2) Face and content-filtered voice
3) Body and randomized spliced voice

4) Body and content-filtered voice

5) Figure and randomized spliced voice

6) Figure and content-filtered voice

The 20 scenes of the PONS are arranged in four affect quadrants. These quadrants are entitled dominance-submission and positive-negative (see Appendix B).

UCLA Social Attainment Survey. The UCLA Social Attainment Survey (Goldstein, 1978) is used to rate premorbid adjustment in schizophrenic patients. It consists of seven items, each of which can receive a score of one to five. Subjects' ratings are based on data from a semi-structured interview with the patient. Individuals fall into one of five graduated categories of premorbid adjustment, based on cut-off scores supplied by Goldstein (1978). Separate cut-off scores are given for both males and females, since Goldstein has found that females obtain significantly higher premorbid scores than males (see Appendix C).

Goldstein (1978) does not present any data on reliability. However, the scale is highly correlated with the Phillips Premorbid Adjustment Scale, which is used more frequently. The Phillips scale reporte reliability between raters from .59 to .98, with the majority of coefficients being greater or equal to than .84 (Kokes, Strauss, and Klorman, 1978). Goldstein's scale has the advantage, however, of being less cumbersome to rate.

Research Diagnostic Criteria (RDC). The Research Diagnostic Criteria (Spitzer, Endicott, Robins, Kurianski, and Gurland, 1975) were developed in order for researchers to have a consistent set of criteria for describing or selecting subject samples with functional illnesses. On the basis of a semi-structured interview, the patient is classified according to the diagnostic criteria established by the RDC. Rather than relying solely on the psychiatric diagnosis already given to the patient (which is known to be highly unreliable), the RDC provides a method of obtaining relatively

homogenous groups of patients (see Appendix D). Spitzer et al. (1975) reported that RDC rater reliability coefficients were from .78 to .84.

Procedure

Prospective subjects were located through hospital records. Only those subjects with a staff diagnosis of schizophrenia were considered for the experiment. Possible subjects were then contacted and told that the investigator was a graduate student doing research for the College of William and Mary. Subjects were informed that the experiment would take place over two sessions. They were then read the consent form. Upon signed consent, subjects took part in the first portion of the experiment. By means of a semi-structured interview, it was ascertained by the investigator whether or not subjects met the criteria for schizophrenia (as measured by the RDC). In addition, subjects who met the criteria for the paranoid subtype were placed in the paranoid group. All other subjects were placed in the nonparanoid group. The interview also contained questions which provided information on which premorbid adjustment scores were based. Following the interview, subjects were administered the two measures of attention.

For the visual portion of the attention task, subjects were initially shown five pictures adapted from the Peabody Vocabulary Test (Dunn, 1959). They were told the following: "I am going to show you some pictures, and I want you to look at them carefully." At the rate of two seconds per picture (which is the same length of stimulus exposure in the PONS), patients were shown the five pictures. These pictures were then mixed with five other pictures which had not been shown to the subjects. The participant was then told: "I am now going to show you some more pictures; and for each one I show you, I want you to tell me whether it was one of those I

have just shown you." The patient was then given a score from 0 - 10, based on his/her performance (see Appendix F).

The auditory portion proceeded in a similar fashion, except the names of five objects were read to the subjects. The subjects were first told that they were going to be read a list of words and that they were to listen carefully. The subjects were then read a list of five objects. Next, the patients were told that they were going to be read a list of some more objects and they were to tell the examiner, for each object, whether or not it was one of the object names that they had just heard. The second list also consisted of ten objects, five of which they had previously heard. The subject was then scored in the same fashion as the visual portion (see Appendix G). Audio and visual measures of attention were presented in random order among the subjects.

Within two to four days of the preliminary interview, subjects were administered the PONS by a male experimenter who was blind to the purpose of the investigation. The standardized instructions by Rosenthal et al (1979b) were read to the subjects (see Appendix E). Since many patients could not read, the response choices for each segment were read to the subjects. The blind experimenter was thus employed as a means of preventing any response bias due to nonverbal cues from the investigator.

RESULTS

Paranoid-reactive and nonparanoid process schizophrenic subjects were compared for differences in chronicity, age, medication levels, education, and premorbid adjustment. The results of t - test comparisons of the data presented in Table 1 indicate that there were no significant differences between the groups in chronicity, education, age, or medication levels. The groups did differ significantly on the measure of premorbid adjustment, $t(30) = 7.12$, $p < .001$.

The large standard deviations for chronicity and medication levels make the results of the t - tests for these measures practically meaningless. Therefore, a Mann-Whitney U test was performed on these variables. But this test also failed to reveal any significant differences among the groups.

There were two ways in which to analyze the data, in terms of the hypotheses stated previously. The first method would be to perform a five-way analysis of variance. A second way would be to perform separate analyses for each hypothesis. The second manner of treating the data was chosen because the first procedure would have made it almost impossible to interpret the interactions obtained. In order to correct for the possibility of obtaining chance significant differences, a more stringent alpha level (.01) was adopted.

To assess differences among the experimental groups on sensitivity to nonverbal communication, while controlling for attention effects at the same time, a 2 (gender) x 2 (classification) analysis of covariance (ANCOVA) was performed on total PONS scores. The auditory and visual measures of attention served as covariates in all of the analyses. Results indicated that the paranoid-reactive group performed significantly better than the

Table 1

T-tests: Paranoid-Nonparanoid Group Data

Measure	Paranoid		Nonparanoid	
	$\bar{X}$	SD	$\bar{X}$	SD
Age (in years)	41.7	11.4	43.6	9.98
Chronicity (in months)	47.1	58.7	90.2	80.8
Education (in years)	10.56	4.33	10.37	3.53
Medication[a]	890.31	673.9	929.5	713.29
Premorbid Adjustment*	26.8	4.14	15.9	2.69

[a]Phenothiazine equivalents in milligrams (Lehmann, 1975).

*$P < .01$.

Table 2

Analysis of Covariance: Total PONS Score

Source	Degrees of Freedom	Mean Square	F Ratio
Gender (G)	1	0.06	N.S.
Diagnostic Category (C)	1	2084.89	8.10*
G X C	1	18.13	N.S.
1st Covariate (visual)	1	25.02	N.S.
2nd Covariate (auditory)	1	3.67	N.S.
All Coraviates	2	19.22	N.S.
Error	26	257.45	

*$p < .01$.

nonparanoid-process group in the decoding of nonverbal communication, $F(1, 26) = 8.10$, $p < .01$. The mean for the paranoid-reactive group was 138.62; and the mean for the nonparanoid-process group was 121.25. No significant gender difference was found. Table 2 shows this analysis.

A 2 (gender) x 2 (classification) x 2 (channel purity) ANCOVA, with repeated measures on the third factor, was conducted to assess the effects of the addition of nonverbal cues on the subjects' decoding accuracy. Results indicated that regardless of the nature of the channel (pure or mixed), the paranoid-reactive subjects performed significantly better, $F(1, 28) = 8.10$, $p < .01$. There was no significant effect due to gender. The paranoid-reactive group obtained a mean of 69.30, while the nonparanoid-process group had a mean of 60.87.

In addition, it was found that regardless of gender or classification, all groups performed significantly better on the pure channels, $F(1, 28) = 7.79$, $p < .01$. This finding indicates that the addition of nonverbal cues decreased the subjects' decoding accuracy. The mean for the pure channels was 67.25, compared with a mean of 62.94 for the mixed channels. These results are presented in Table 3.

To determine accuracy on the audio and visual channels, two 2 (gender) x 2 (classification) ANCOVAs (one for video and one for audio) were performed. On the video channels, the paranoid-reactive group performed significantly better than the nonparanoid-process group, $F(1, 26) = 11.29$, $p < .01$. The means were 39.80 for the paranoid-reactive group and 33.86 for the nonparanoid-process group. No significant difference was found for classification on the audio channels. The means on these channels were 21.1 for the paranoid-reactive group and 20.2 for the nonparaoind-process group. In addition, no significant gender differences were found on either

Table 3

Analysis of Covariance: Addition of Channels

Source	Degrees of Freedom	Mean Square	F Ratio
Gender (G)	1	0.03	N.S.
Diagnostic Category (C)	1	1042.44	8.10*
G X C	1	9.06	N.S.
1st Covariate (visual)	1	12.05	N.S.
2nd Covariate (audio)	1	1.84	N.S.
All Covariates	2	9.61	N.S.
Error	26	128.73	
Channel purity (P)[a]	1	297.56	7.79*
P X G	1	22.56	N.S.
P X C	1	20.25	N.S.
P X G X C	1	12.25	N.S.
Error	28	38.19	

[a]There was an empty cell in the design, making the numbers of the scenes for the pure and mixed channels unequal. To compensate for the inequality, the empty cell was filled with a chance-level score for each person (as suggested by Rosenthal et al., 1979b).

*$p < .01$.

Table 4

Analysis of Covariance: Visual Channels

Source	Degrees of Freedom	Mean Square	F Ratio
Gender (G)	1	32.91	N.S.
Diagnostic Category (C)	1	305.36	11.29*
G X C	1	0.03	N.S.
1st Covariate (visual)	1	18.95	N.S.
2nd Covariate (Audio)	1	0.03	N.S.
All Covariates	2	10.25	N.S.
Error	26	27.04	

* $p < .01$.

Table 5

Analysis of Covariance: Audio Channels

Source	Degrees of Freedom	Mean Square	F Ratio
Gender (G)	1	6.44	N.S.
Diagnostic Category (C)	1	5.86	N.S.
G X C	1	19.77	N.S.
1st Covariate (visual)	1	5.00	N.S.
2nd Covariate (audio)	1	1.44	N.S.
All Covariates	2	2.64	N.S.
Error	26	10.76	

the audio or visual channels. Tables 4 and 5 present the results for the analyses.

Finally, a 2 (gender) x 2 (classification) x 2 (positivity) x 2 (dominance) ANCOVA, with repeated measures on the last two factors, was performed. This was done to assess differences in accuracy on the affect dimensions of the PONS. Results indicated that regardless of the affect scene, the paranoid-reactive group obtained significantly higher scores than the nonparanoid-process group, $F(1, 26) = 8.91$, $p < .01$. The paranoid-reactive group had a mean of 34.84, and the nonparanoid-process group received a mean of 30.63. Again, no significant gender difference was found.

All subjects (regardless of gender or classification) obtained significantly higher scores on the dominant affect scenes, $F(1, 26) = 11.67$, $p < .01$. The mean for the dominant affect scenes was 33.78, and the mean for the submissive affect scenes was 31.69. A directional trend was also found, indicating that the subjects were more accurate on the channels conveying negative affect than on those conveying positive affect, $F(1, 26) = 3.42$, $p < .10$. The mean for the negative affect scenes was 33.59, while the mean for the positive affect scenes was 31.88. These data are presented in Table 6.

Table 6

Analysis of Covariance: Affect Scenes

Source	Degrees of Freedom	Mean Square	F Ratio
Gender (G)	1	0.70	N.S.
Diagnostic category (C)	1	518.31	8.91*
G X C	1	14.95	N.S.
1st Covariate (visual)	1	13.91	N.S.
2nd Covariate (auditory)	1	10.18	N.S.
All covariates	2	7.23	N.S.
Error	26	58.18	
Positivity (P)	1	94.93	N.S.
P X G	1	24.50	N.S.
P X C	1	30.03	N.S.
P X G X C	1	12.50	N.S.
Error	28	27.60	
Dominance (D)	1	140.28	11.67*
D X G	1	2.00	N.S.
D X C	1	26.28	N.S.
D X G X C	1	12.50	N.S.
Error	28	12.02	
P X D	1	34.03	N.S.
P X D X G	1	1.12	N.S.
P X D X C	1	2.53	N.S.
P X D X G X C	1	2.00	N.S.
Error	28	20.71	

* $p < .01$.

DISCUSSION

Results of the present study supported the hypothesis that the paranoid-reactive group would be more accurate than the nonparanoid-process group in decoding nonverbal cues. This finding is not surprising, since LaRusso (1978) found paranoid subjects to be more sensitive than normal subjects to nonverbal cues. It is not clear from his study whether or not the paranoid patients he used were paranoid schizophrenic subjects. The present study indicates that the paranoid-reactive schizophrenic individuals are better at decoding nonverbal cues (at least compared with another subtype of schizophrenia). In either case, the paranoid subjects did better than their nonparanoid counterparts, with regard to nonverbal skills. Insignificant differences among chronicity, education, age, and medication levels in the present study add further support to this finding.

If one views nonverbal skills as a sign of interpersonal competency, the greater sensitivity to nonverbal communication exhibited by the paranoid-reactive group adds support to Sullivan's interpersonal theory. Sullivan (1959) noted that indidivuals who had obtained intimacy with others before the onset of illness were less likely to undergo as severe a breakdown than those who had experienced no intimacy prior to illness. As Kantor and Winder (1959) note, the earlier in life that a person experiences a severe stress, the more damage it will have on the individual's subsequent interpersonal relationships. This is also the basic premise for the process-reactive continuum. Paranoid-reactive subjects (who are described as experiencing a relatively normal socialization process up to the onset of the illness) do tend to be more successful interpersonally than the process patient (who is described as being socially isolated from birth).

The hypothesis that the paranoid-reactive group would benefit more from the addition of channels than the nonparanoid-process group was not supported. Instead, it was found that both groups performed significantly worse when nonverbal information was presented in both visual and auditory modalities rather than in a single channel. This indicates that both groups found decoding more difficult with the addition of extra modalities.

The fact that the decoding performance of nonparanoid-process patients was impaired by presenting cues from more than one modality is not surprising, in light of Meisleman's (1963) findings. His research showed that chronic nonparanoid patients were especially impaired when required to process cues from both auditory and visual modalities. The surprising result was the reduced decoding performance of the paranoid-reactive group with the addition of channels. McGhie's (1973) findings, showing that paranoids were less distractible than normals (even with the presentation of competing stimuli), would suggest that paranoid subjects would improve with the presentation of mixed channels.

A possible explanation for the decreased decoding accuracy of this group with the addition of channels might be the effects of long-term hospitalization, which was characteristic of this group. The median length of hospitalization for the paranoid-reactive group was approximately four years. Researchers such as Broen (1968) suggest that long-term hospitalization results in impaired information processing. This processing impairment has also been found by Silverman, Berg, and Kantor (1965) among long-term prisoners. Unless there was a high proportion of schizophrenic prisoners in their study, it may be proposed that long-term confinement, rather than schizophrenia, results in information-processing impairment. A topic for further research would be whether or not this deficit in information processing exists among schizophrenic patients who have been hospitalized for shorter

periods of time.

The discrepancy in performance among psychiatric patients on mixed channels was not found by Rosenthal et al. (1979b). Although the psychiatric group used in their study performed significantly worse than normals with the addition of cues, they still benefited from these mixed channels. However, the nature of the psychiatric group used in Rosenthal et al.'s study is unknown. Their study used patients in a psychiatric hospital, without regard to diagnosis (note 1). A possible explanation for the apparent benefit which these psychiatric patients received from the addition of channels would be the presence of a low number of schizophrenic patients in their sample, or a large number of short-term hospitalized patients.

The hypothesis that the paranoid-reactive group would perform better on visual cues was confirmed. This provided support for Rosenthal et al.'s (1979b) tentative conclusion that increased socialization results in higher decoding accuracy on video channels. This might further substantiate the process-reactive premise that reactive patients are more effective interpersonally (more socialized) than process patients.

The hypothesis that the nonparanoid-process (less socialized) group would perform better on the audio cues was not supported. The mean scores for these groups did not differ significantly. However, it should be noted that since the paranoid-reactive group (in general) were more sensitive nonverbally than the nonparanoid-process group, the fact that there was no difference between the groups on the audio cues might be significant in itself. An inspection of the means for each group on the audio channels (as presented in the results) shows that both groups' sensitivity to nonverbal communication decreased on the audio channels. The differences

between visual and auditory scores were greater for the paranoid-reactive group. This finding might suggest that paranoid-reactive schizophrenics cannot contend with auditory cues because premorbid histories of socialization, with conditioning to visual cues, might interfere with accurate auditory decoding.

The final hypothesis, that the nonparanoid-process group would be more sensitive to positive-submissive affect and that the paranoid-reactive group would be more sensitive to dominant affect, was only partially supported. The nonparanoid-process group was not more sensitive to the positive-submissive affect cues; but both groups were more sensitive to the dominant affect cues. This does not support Rosenthal et al.'s (1979b) findings linking sophistication (socialization) and affect dimensions. What it does suggest is that all schizophrenic groups are similar to normals in their nonverbal sensitivity to affect. Although the scores of schizophrenic patients were not as high as those reported in normals by Rosenthal et al. (1979b), both groups scored significantly higher on dominant than on submissive scenes. A directional trend also indicated that schizophrenic subjects scored higher on negative than on positive affect scenes. Normal individuals have also been reported to exhibit this same pattern (Rosenthal et al., 1979b). This higher sensitivity to negative affect scenes was also found by Rosenthal et al. in their group of psychiatric patients.

Findings associated with the above four hypotheses were compared with findings from Rosenthal et al.'s (1979b) study. These comparisons provide a picture of similarities and differences among the schizophrenic sample of the present study and normal and psychiatric subjects of the previous study (see Tables 7 and 8). As can be seen in these Tables, Rosenthal et al.'s

psychiatric subjects scored consistently higher than subjects in the present study on all measures of nonverbal decoding accuracy. This discrepancy in scores might be due to the nature of the samples used in each study. Patients in the previous study were either from foreign public hospitals or private American hospitals. The present study included patients from a public American hospital. Confounding of American-non-American and public-private hospital samples may have thus contributed to the score differences (Rosenthal, Note 1).

One other finding in the present study deserves consideration for discussion. In all hypotheses, no gender differences were found. This finding is significant in itself, because most studies have found that females are better than males in decoding nonverbal cues (Hall, 1978). This gender difference has also been found using the PONS, both with young children and adults (Rosenthal et al., 1979b). One possible explanation for the absence of gender differences among schizophrenic patients in decoding abilities (as opposed to normals) would be that schizophrenic females never develop the increased nonverbal sensitivity seen in normals because of the pathological nature of the family system, as suggested by the double-bind theory. Obviously, this topic deserves further investigation.

Although males and females in the present study did not differ in their sensitivity to nonverbal communication, differences among paranoid-reactive and nonparanoid-process groups have important implications for the treatment of schizophrenia. Therapists communicate their feelings to the client through nonverbal cues, either consciously or unconsciously. Since studies have found that more weight is given to nonverbal than to verbal cues by the decoder, it is extremely important that a patient be able to accurately interpret nonverbal cues. Most studies, however, focus on

Table 7

Comparison of Accuracy on Various Nonverbal Scenes for two Studies

Subjects	Nonverbal Scene				
	Total	Pure	Mixed	Audio	Visual
Rosenthal et al. (1979b)					
Normals[a]	75.2%	68.8%	81.6%	61.9%	79.7%
Psychiatric patients[b]	69.4	64.0	74.6	58.0	73.0
Present Study					
Paranoid-reactive[c]	63.0	59.2	56.6	52.7	66.4
Nonparanoid-process[d]	55.3	52.9	48.3	53.6	55.6

[a] n = 68.

[b] n = 482.

[c] n = 16.

[d] n = 16.

Table 8

Comparison of Accuracy on Affect Scenes for Two Studies

Subjects	Quadrant			
	Negative	Positive	Dominant	Submissive
Rosenthal et al. (1979b)				
Normals[a]	78.7%	71.7%	72.2%	73.2%
Psychiatric patients[b]	73.1	65.5	70.4	68.4
Present study				
Paranoid-reactive[c]	65.8	60.9	64.4	62.3
Nonparanoid-process[d]	56.4	55.0	58.4	53.0

[a] n = 482.

[b] n = 68.

[c] n = 16.

[d] n = 16.

nonverbal skills of the therapist and ignore those of the client, who might be deficient in interpreting these cues. The simultaneous presentation of both visual and auditory cues by a therapist may cause a schizophrenic individual to lose the meaning of, or misinterpret, these cues. Perhaps it might be possible for the therapist to attempt presenting nonverbal cues to the client by one modality at a time. This might lessen the effects that mixed channels appear to have on decoding and consequent interpersonal relations.

This might be particularly difficult for the therapist (or anyone else) to achieve. Instead, now that the differential deficits in decoding skills among the groups have been found, it might be possible to develop strategies to improve these skills. The improvement of nonverbal communication skills in individuals with mental disorders has been suggested by Argyle (1978). This researcher has suggested that decoding accuracy in the visual modality may be improved by training subjects to correctly identify facial expressions in photographs (such as those produced by Ekman and Friesen, 1975). Argyle has also suggested that accuracy in auditory nonverbal communcations might be improved by training subjects to discriminate between different emotions portrayed in tape recordings of neutral messages. Tape recordings such as these have been developed by Davitz (1964). Increased accuracy in the decoding of nonverbal communication, combined with training in coping skills, might thus aid in the formation and maintenance of successful and satisfying interpersonal relationships.

Appendix A

PONS Answer Sheet

Adapted from Rosenthal et al. (1979 a, b).

Full PONS Test

NONVERBAL COMMUNICATION

Name _____ Present address _____

Town and country of birth _____ Age _____ Sex _____

Primary language spoken _____ Secondary language spoken _____

Father's occupation _____ Mother's occupation _____

Field of study _____ Average grade in last year of school _____

INSTRUCTIONS: Please circle the letter (A or B) next to the label which best describes the scene you have just seen and/or heard.

SAMPLE ANSWER: Scene 1. (B) A. admiring a baby
(B) applying for a job

Scene 1. A. expressing jealous anger
B. talking to a lost child

Scene 2. A. talking to a lost child
B. admiring nature

Scene 3. A. talking about the death of a friend
B. talking to a lost child

Scene 4. A. leaving on a trip
B. saying a prayer

Scene 5. A. criticizing someone for being late
B. expressing gratitude

Scene 6. A. helping a customer
B. expressing gratitude

Scene 7. A. criticizing someone for being late
B. leaving on a trip

Scene 8. A. talking about one's wedding
B. expressing gratitude

Scene 9. A. helping a customer
B. talking about one's divorce

Scene 10. A. talking about the death of a friend
B. trying to seduce someone

Scene 11. A. talking to a lost child
B. helping a customer

Scene 12. A. admiring nature
B. expressing motherly love

Scene 13. A. expressing deep affection
B. nagging a child

Scene 14. A. expressing motherly love
B. asking forgiveness

Scene 15. A. admiring nature
B. helping a customer

Scene 16. A. admiring nature
B. saying a prayer

Scene 17. A. nagging a child
B. admiring nature

Scene 18. A. nagging a child
B. criticizing someone for being late

Scene 19. A. asking forgiveness
B. leaving on a trip

Scene 20. A. expressing gratitude
B. leaving on a trip

Scene 21. A. leaving on a trip
B. returning faulty item to a store

Scene 22. A. returning faulty item to a store
B. talking about one's divorce

Scene 23. A. expressing jealous anger
B. talking about one's divorce

Scene 24. A. talking about the death of a friend
B. threatening someone

Scene 25. A. expressing deep affection
B. saying a prayer

Scene 26. A. expressing deep affection
B. trying to seduce someone

Scene 27. A. nagging a child
B. expressing motherly love

Scene 28. A. leaving on a trip
B. ordering food in a restaurant

Scene 29. A. helping a customer
B. expressing jealous anger

Scene 30. A. criticizing someone for being late
B. expressing gratitude

Scene 31. A. threatening someone
B. talking about one's wedding

Scene 32. A. admiring nature
B. expressing strong dislike

Scene 33. A. ordering food in a restaurant
B. criticizing someone for being late

Scene 34. A. leaving on a trip
B. talking about one's wedding

Scene 35. A. talking to a lost child
B. expressing strong dislike

Scene 36. A. trying to seduce someone
B. expressing jealous anger

Scene 37. A. expressing strong dislike
B. expressing deep affection

Scene 38. A. leaving on a trip
B. threatening someone

Scene 39. A. expressing deep affection
B. talking about the death of a friend

Scene 40. A. talking to a lost child
B. criticizing someone for being late

Scene 41. A. ordering food in a restaurant
B. expressing gratitude

Scene 42. A. expressing motherly love
B. threatening someone

Scene 43. A. expressing strong dislike
B. ordering food in a restaurant

Scene 44. A. expressing motherly love
B. talking to a lost child

Scene 45. A. expressing deep affection
B. nagging a child

Scene 46. A. asking forgiveness
B. saying a prayer

Scene 47. A. expressing motherly love
B. helping a customer

Scene 48. A. admiring nature
B. expressing strong dislike

Scene 49. A. expressing motherly love
B. leaving on a trip

Scene 50. A. talking about one's divorce
B. ordering food in a restaurant

Scene 51. A. asking forgiveness
B. nagging a child

Scene 52. A. admiring nature
B. expressing motherly love

Scene 53. A. returning faulty item to a store
B. criticizing someone for being late

Scene 54. A. talking about one's wedding
B. expressing deep affection

Scene 55. A. expressing strong dislike
B. ordering food in a restaurant

Scene 56. A. admiring nature
B. ordering food in a restaurant

Scene 57. A. returning faulty item to a store
B. helping a customer

Scene 58. A. expressing strong dislike
B. expressing gratitude

Scene 59. A. expressing deep affection
B. expressing gratitude

Scene 60. A. saying a prayer
B. threatening someone

Scene 61. A. saying a prayer
B. ordering food in a restaurant

Scene 62. A. admiring nature
B. asking forgiveness

Scene 63. A. talking to a lost child
B. expressing gratitude

Scene 64. A. talking about one's wedding
B. saying a prayer

Scene 65. A. talking to a lost child
B. threatening someone

Scene 66. A. expressing motherly love
B. nagging a child

Scene 67. A. expressing motherly love
B. returning faulty item to a store

Scene 68. A. expressing gratitude
B. expressing strong dislike

Scene 69. A. expressing strong dislike
B. talking about one's wedding

Scene 70. A. helping a customer
B. asking forgiveness

Scene 71. A. threatening someone
B. expressing motherly love

Scene 72. A. nagging a child
B. talking to a lost child

Scene 73. A. talking to a lost child
B. criticizing someone for being late

Scene 74. A. talking about one's divorce
B. trying to seduce someone

Scene 75. A. expressing jealous anger
B. helping a customer

Scene 76. A. talking about one's divorce
B. expressing deep affection

Scene 77. A. expressing gratitude
B. talking to a lost child

Scene 78. A. expressing deep affection
B. asking forgiveness

Scene 79. A. threatening someone
B. nagging a child

Scene 80. A. talking about the death of a friend
B. trying to seduce someone

Scene 81. A. talking about one's wedding
B. talking about one's divorce

Scene 82. A. trying to seduce someone
B. criticizing someone for being late

Scene 83. A. helping a customer
B. admiring nature

Scene 84. A. returning faulty item to a store
B. nagging a child

Scene 85. A. nagging a child
B. leaving on a trip

Scene 86. A. talking about one's wedding
B. admiring nature

Scene 87. A. criticizing someone for being late
B. expressing deep affection

Scene 88. A. admiring nature
B. returning faulty item to a store

Scene 89. A. asking forgiveness
B. expressing strong dislike

Scene 90. A. expressing motherly love
B. helping a customer

Scene 91. A. asking forgiveness
B. leaving on a trip

Scene 92. A. criticizing someone for being late
B. helping a customer

Scene 93. A. talking about one's wedding
B. threatening someone

Scene 94. A. expressing motherly love
B. nagging a child

Scene 95. A. expressing motherly love
B. expressing gratitude

Scene 96. A. talking about one's divorce
B. trying to seduce someone

Scene 97. A. expressing jealous anger
B. asking forgiveness

Scene 98. A. expressing motherly love
B. criticizing someone for being late

Scene 99. A. talking about one's wedding
B. talking about the death of a friend

Scene 100. A. expressing strong dislike
B. asking forgiveness

Scene 101. A. saying a prayer
B. helping a customer

Scene 102. A. nagging a child
B. leaving on a trip

Scene 103. A. talking about one's divorce
B. asking forgiveness

Scene 104. A. ordering food in a restaurant
B. expressing jealous anger

Scene 105. A. criticizing someone for being late
B. talking about the death of a friend

Scene 106. A. talking about the death of a friend
B. ordering food in a restaurant

Scene 107. A. leaving on a trip
B. nagging a child

Scene 108. A. saying a prayer
B. talking about one's divorce

Scene 109. A. expressing strong dislike
B. trying to seduce someone

Scene 110. A. ordering food in a restaurant
B. asking forgiveness

Scene 111. A. talking about one's wedding
B. leaving on a trip

Scene 112. A. expressing deep affection
B. admiring nature

Scene 113. A. expressing jealous anger
B. criticizing someone for being late

Scene 114. A. talking about one's divorce
B. threatening someone

Scene 115. A. expressing strong dislike
B. returning faulty item to a store

Scene 116. A. ordering food in a restaurant
B. threatening someone

Scene 117. A. talking to a lost child
B. criticizing someone for being late

Scene 118. A. admiring nature
B. nagging a child

Scene 119. A. expressing strong dislike
B. helping a customer

Scene 120. A. talking about one's wedding
B. ordering food in a restaurant

Scene 121. A. expressing gratitude
B. expressing motherly love

Scene 122. A. leaving on a trip
B. expressing deep affection

Scene 123. A. nagging a child
B. talking to a lost child

Scene 124. A. returning faulty item to a store
B. expressing motherly love

Scene 125. A. talking about one's divorce
B. admiring nature

Scene 126. A. expressing deep affection
B. talking about the death of a friend

Scene 127. A. talking about one's divorce
B. admiring nature

Scene 128. A. expressing deep affection
B. admiring nature

Scene 129. A. talking to a lost child
B. admiring nature

Scene 130. A. returning faulty item to a store
B. talking about the death of a friend

Scene 131. A. talking about one's wedding
B. returning faulty item to a store

Scene 132. A. admiring nature
B. leaving on a trip

Scene 133. A. asking forgiveness
B. helping a customer

Scene 134. A. expressing strong dislike
B. ordering food in a restaurant

Scene 135. A. returning faulty item to a store
B. talking about the death of a friend

Scene 136. A. expressing deep affection
B. saying a prayer

Scene 137. A. saying a prayer
B. criticizing someone for being late

Scene 138. A. talking about one's wedding
B. talking about one's divorce

Scene 139. A. expressing gratitude
B. expressing motherly love

Scene 140. A. expressing jealous anger
B. threatening someone

Scene 141. A. asking forgiveness
B. expressing motherly love

Scene 142. A. admiring nature
B. ordering food in a restaurant

Scene 143. A. expressing motherly love
B. expressing jealous anger

Scene 144. A. expressing jealous anger
B. helping a customer

Scene 145. A. ordering food in a restaurant
B. returning faulty item to a store

Scene 146. A. talking about one's divorce
B. leaving on a trip

Scene 147. A. nagging a child
B. saying a prayer

Scene 148. A. trying to seduce someone
B. criticizing someone for being late

Scene 149. A. expressing deep affection
B. admiring nature

Scene 150. A. talking about the death of a friend
B. expressing motherly love

Scene 151. A. expressing gratitude
B. expressing strong dislike

Scene 152. A. expressing deep affection
B. returning faulty item to a store

Scene 153. A. expressing gratitude
B. threatening someone

Scene 154. A. leaving on a trip
B. talking to a lost child

Scene 155. A. talking about the death of a friend
B. expressing jealous anger

Scene 156. A. helping a customer
B. expressing gratitude

Scene 157. A. asking forgiveness
B. saying a prayer

Scene 158. A. trying to seduce someone
B. expressing gratitude

Scene 159. A. expressing jealous anger
B. saying a prayer

Scene 160. A. criticizing someone for being late
B. helping a customer

Scene 161. A. expressing strong dislike
B. expressing deep affection

Scene 162. A. expressing deep affection
B. talking about the death of a friend

Scene 163. A. returning faulty item to a store
B. leaving on a trip

Scene 164. A. expressing gratitude
B. expressing jealous anger

Scene 165. A. talking about one's wedding
B. trying to seduce someone

Scene 166. A. talking to a lost child
B. expressing jealous anger

Scene 167. A. talking to a lost child
B. talking about the death of a friend

Scene 168. A. talking about one's divorce
B. asking forgiveness

Scene 169. A. trying to seduce someone
B. threatening someone

Scene 170. A. expressing gratitude
B. expressing jealous anger

Scene 171. A. talking about one's wedding
B. criticizing someone for being late

Scene 172. A. returning faulty item to store
B. expressing strong dislike

Scene 173. A. expressing gratitude
B. talking to a lost child

Scene 174. A. expressing gratitude
B. returning faulty item to store

Scene 175. A. expressing motherly love
B. criticizing someone for being late

Scene 176. A. ordering food in a restaurant
B. expressing jealous anger

Scene 177. A. expressing gratitude
B. returning faulty item to a store

Scene 178. A. expressing strong dislike
B. talking about one's divorce

Scene 179. A. talking about one's divorce
B. talking about the death of a friend

Scene 180. A. ordering food in a restaurant
B. returning faulty item to a store

Scene 181. A. expressing motherly love
B. talking to a lost child

Scene 182. A. trying to seduce someone
B. talking about one's wedding

Scene 183. A. leaving on a trip
B. trying to seduce someone

Scene 184. A. talking about the death of a friend
B. asking forgiveness

Scene 185. A. trying to seduce someone
B. talking to a lost child

Scene 186. A. expressing motherly love
B. ordering food in a restaurant

Scene 187. A. saying a prayer
B. expressing jealous anger

Scene 188. A. trying to seduce someone
B. talking about the death of a friend

Scene 189. A. ordering food in a restaurant
B. talking about the death of a friend

Scene 190. A. helping a customer
B. trying to seduce someone

Scene 191. A. expressing motherly love
B. criticizing someone for being late

Scene 192. A. saying a prayer
B. nagging a child

Scene 193. A. talking to a lost child
B. expressing deep affection

Scene 194. A. talking about one's divorce
B. returning faulty item to a store

Scene 195. A. threatening someone
B. helping a customer

Scene 196. A. criticizing someone for being late
B. talking about one's divorce

Scene 197. A. expressing jealous anger
B. nagging a child

Scene 198. A. talking about one's wedding
B. expressing jealous anger

Scene 199. A. trying to seduce someone
B. expressing deep affection

Scene 200. A. threatening someone
B. expressing strong dislike

Scene 201. A. talking about one's wedding
B. talking about the death of a friend

Scene 202. A. talking about one's divorce
B. talking about one's wedding

Scene 203. A. threatening someone
B. expressing strong dislike

Scene 204. A. admiring nature
B. criticizing someone for being late

Scene 205. A. ordering food in a restaurant
B. nagging a child

Scene 206. A. expressing gratitude
B. threatening someone

Scene 207. A. talking about one's wedding
B. saying a prayer

Scene 208. A. admiring nature
B. talking about the death of a friend

Scene 209. A. trying to seduce someone
B. saying a prayer

Scene 210. A. talking about one's divorce
B. threatening someone

Scene 211. A. expressing deep affection
B. trying to seduce someone

Scene 212. A. saying a prayer
B. talking about one's wedding

Scene 213. A. leaving on a trip
B. trying to seduce someone

Scene 214. A. saying a prayer
B. talking to a lost child

Scene 215. A. admiring nature
B. talking about one's wedding

Scene 216. A. expressing jealous anger
B. criticizing someone for being late

Scene 217. A. leaving on a trip
B. ordering food in a restaurant

Scene 218. A. expressing strong dislike
B. talking to a lost child

Scene 219. A. expressing jealous anger
B. saying a prayer

Scene 220. A. asking forgiveness
B. expressing gratitude

Appendix B

PONS Twenty Scenes and Their Affect Quadrants

Adapted from Rosenthal et al. (1979 b).

Twenty Scenes Arranged by Affect in Four Quadrants

		Dominance	
		Submissive	Dominant
Positivity	Positive	helping a customer	talking about one's wedding
		ordering food in a restaurant	leaving on a trip
		expressing gratitude	expressing motherly love
		expressing deep affection	admiring nature
		trying to seduce someone	talking to a lost child
	Negative	talking about the death of a friend	criticizing someone for being late
		talking about one's divorce	nagging a child
		returning faulty item to a store	expressing strong dislike
		asking forgiveness	threatening someone
		saying a prayer	expressing jealous anger

Appendix C

UCLA Social Attainment Scale

Adapted from Goldstein (1978)

Premorbid Adjustment Scale—UCLA Social Attainment Survey

The following ratings are based upon the adolescent social adjustment (16 to 20 years) of male and female patients.

1. **Same-sex poor relationships**

   Number and closeness of relationships with like-sexed youngsters his own age. Do not include in this rating transient relationships, those with younger or older individuals, or relationships with relatives.
   1. No friends his own age.
   2. One or two casual friends only.
   3. Several casual friends or close relationship with one individual only.
   4. Several casual friends with one or two close relationships.
   5. Several casual friends with three or more close relationships.

2. **Leadership in same-sex peer relations**

   Frequency with which patient assumed a leadership role with like-sexed youngsters his own age. How often did he seek out others, or make plans or decisions for his group?
   1. Never assumed leadership. Almost always waited for others.
   2. Rarely assumed leadership.
   3. Sometimes assumed leadership.
   4. Often assumed leadership.
   5. Usually assumed leadership role. Actively showed initiative in making plans and decisions with others every day.

3. **Opposite-sex peer relations**

   Involvement with, and emotional commitment to a member of the opposite sex. The extent to which the patient extended himself for another, showed concern for their needs and interests.
   1. No emotional involvement with an opposite-sexed peer.
   2. Mild emotional involvement.
   3. Moderate emotional involvement.
   4. Strong but intermittent emotional involvement.
   5. Strong continuous involvement and commitment to an opposite-sexed peer.

4. **Dating history**
   1. Never dated.
   2. Dated a few times.
   3. Occasionally went out on dates.
   4. Dated often but never had a lasting steady association.
   5. Dated regularly and went steady.

5. Sexual experience

1. No interest in sex.
2. Interested but no sexual play or intercourse.
3. Sexual play only on one or two occasions.
4. Sexual play or intercourse on one or two occasions.
5. Sexual intercourse and sexual play on several occasions.

6. Outside activities

Number of activities outside the home the patient initiated on his own, e.g., movies, dances, parties, shopping, picnics, hobbies, camping, riding, hiking.

1. Initiated no activities outside the home.
2. One or two outside activities.
3. Several outside activities.
4. Moderate number of outside activities.
5. Initiated many outside activities.

7. Participation in organizations

Attendance and participation in activities of organizations or social clubs on his own initiative, e.g., church, scouts, YMCA, school sport, or social club. Do not rate involvements of less than 6 months.

1. Did not attend any of these activities.
2. Belonged to none but occasionally attended.
3. Belonged to at least one organization and sometimes attended, but rarely participated.
4. Belonged to at least one organization and sometimes participated.
5. Belonged to at least one organization, attended regularly, and participated actively.

Appendix D

Research Diagnostic Criteria for Schizophrenia and the Paranoid Subtype

Adapted from Spitzer et al. (1975)

Present episode:[1]	1. No 2. Probable 3. Definite	Duration of present episode[1]: _____ (weeks)	Age at first episode: ___	Previous episode followed by significant improvement:[1]	1. No 2. Probable 3. Definite

There are many different approaches to the diagnosis of Schizophrenia. The approach taken here avoids limiting the diagnosis to cases with a chronic deteriorating course. However, the criteria are designed to screen out borderline conditions, brief hysterical or situational psychoses, and paranoid states. Patients with a full depressive or manic syndrome who would otherwise meet the Schizophrenia criteria are excluded and are diagnosed as either Schizo-affective Disorder, Major Depressive Disorder, or Manic Disorder.

A through C are required for the episode of illness being considered.

A. At least 2 of the following are required for definite, and 1 for probable.
   (1) Thought broadcasting, insertion, or withdrawal (as defined in this manual).
   (2) Delusions of control, other bizarre delusions, or multiple delusions (as defined in this manual).
   (3) Delusions other than persecutory or jealousy, lasting at least 1 week.
   (4) Delusions of any type if accompanied by hallucinations of any type for at least 1 week.
   (5) Auditory hallucinations in which either a voice keeps up a running commentary on the patient's behaviors or thoughts as they occur, or 2 or more voices converse with each other.
   (6) Nonaffective verbal hallucinations spoken to the subject (as defined in this manual).
   (7) Hallucinations of any type throughout the day for several days or intermittently for at least 1 month.
   (8) Definite instances of formal thought disorder (as defined in this manual).
   (9) Obvious catatonic motor behavior (as defined in this manual).

B. A period of illness lasting at least 2 weeks.

C. At no time during the active period of illness being considered did the patient meet the criteria for either probable or definite manic or depressive syndrome (criteria A and B under Major Depressive or Manic Disorders) to such a degree that it was a prominent part of the illness.

Paranoid. Throughout the active period of the episode of illness the clinical picture is dominated by the relative persistence of, or preoccupation with, 1 or more of the following:

1. Persecutory delusions.
2. Grandiose delusions.
3. Delusions of jealousy.
4. Hallucinations with a persecutory or grandiose content.

Appendix E

PONS Instructions

Adapted from Rosenthal et al. (1979b).

INSTRUCTIONS READ BY TEST ADMINISTRATOR

The film and sound track you are about to witness was designed so that we may learn how well people can match facial expressions, body movements, and tones of voice to the actual situation in which the expressions, movements, and tones originally occurred.

You will see and hear a series of audio and video segments, and for each one you are to judge which of two real-life situations is represented by the segment you have just seen or heard. After each segment you will have a short period of time in which to record your judgment.

Some of the visual segments will have no sound track. Some of the visual segments will have a sound track, but you will not be able to understand the words. Instead, you will hear speech that has been changed in various ways, so that you will be able to judge *only the tone of voice* in which something was said. Some of the segments will be made up of only these speech-altered portions of the sound track, and for these there will be no film to watch at all. In fact, the very first segment is like this.

Each segment you will see and/or hear has been numbered on the screen, and this number corresponds to a number on your answer sheet. Your answer sheet lists two brief descriptions of everyday life situations for each segment. One of these descriptions correctly describes the actual situation you will see and/or hear, while the other description does *not* describe the situation accurately. For each numbered segment, please circle the letter *A* or *B* next to the situation you believe to correspond to the segment you have just seen and/or heard.

When you see a number appear on the screen, please find the corresponding number on your answer sheet and place your finger just in front of the number, to keep your place. Watch and/or listen to the segment that follows the number, and as soon as the segment ends circle the letter *A* or *B* corresponding to the situation you believe the segment to have been based upon. Then look to the screen again promptly to find the next number flashed on the screen.

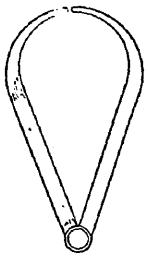
Many of the choices will be difficult, but you should choose one of the descriptions even though you may feel quite uncertain about the correct answer. Choose the more likely description for each segment even if you feel you might be guessing. Your guesses may be much more accurate than you would imagine. In fact, we request that you do not change any answers once you have made a choice. For every segment, then, do the best you can to judge accurately the situations upon which each segment is based. Your answer sheet contains a sample answer, which you should look at now.

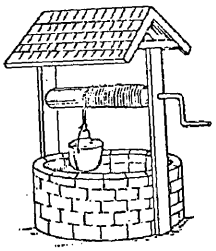
All ready to start? Now we will begin.

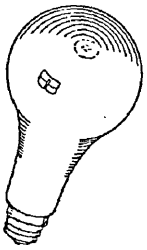
Appendix F

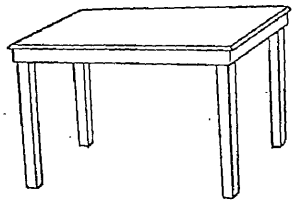
Visual Attention Gues

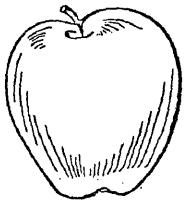
Adapted from Dunn (1959)

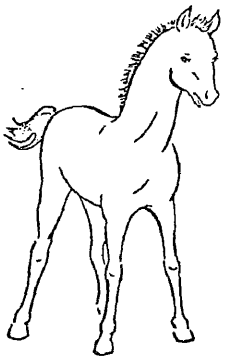


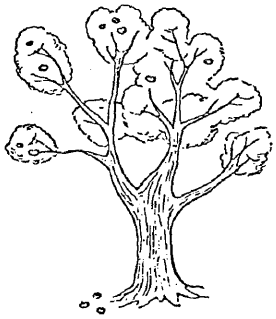


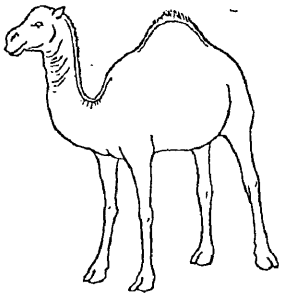


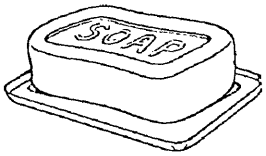


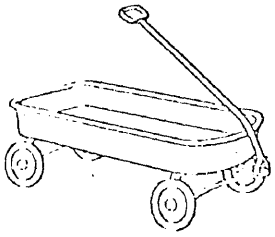









SOAP



Appendix G

Auditory Attention Cues

1. Pencil
2. Sock
3. Butterfly
4. Cow
5. Brush
6. Knife
7. Bicycle
8. Train
9. Clock
10. Window

Reference Notes

1. Rosenthal, R. Personal communication, February 24, 1981.

2. Weinstein, S. Towards an interpersonal behavior taxonomy of schizophrenia: An exploratory study. Unpublished manuscript. College of William and Mary, 1980.

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