University of New Hampshire
University of New Hampshire Scholars' Repository

Doctoral Dissertations | Student Scholarship

Summer 1970

SELECTIVE ATTENTION BEHAVIOR AS PREDICTED BY ADLER'S SOCIAL INTEREST HYPOTHESIS

R JOHN HUBER

Follow this and additional works at: https://scholars.unh.edu/dissertation

Recommended Citation
HUBER, R JOHN, "SELECTIVE ATTENTION BEHAVIOR AS PREDICTED BY ADLER'S SOCIAL INTEREST HYPOTHESIS" (1970). *Doctoral Dissertations*. 934.
https://scholars.unh.edu/dissertation/934

This Dissertation is brought to you for free and open access by the Student Scholarship at University of New Hampshire Scholars' Repository. It has been accepted for inclusion in Doctoral Dissertations by an authorized administrator of University of New Hampshire Scholars' Repository. For more information, please contact nicole.hentz@unh.edu.

71-8610

HUBER, R. John, 1940-
SELECTIVE ATTENTION BEHAVIOR AS PREDICTED BY ADLER'S SOCIAL INTEREST HYPOTHESIS.

University of New Hampshire, Ph.D., 1970
Psychology, experimental

University Microfilms, A XEROX Company, Ann Arbor, Michigan

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED

SELECTIVE ATTENTION BEHAVIOR AS PREDICTED BY ADLER'S SOCIAL INTEREST HYPOTHESIS

by

R. JOHN HUBER

B. A. Kent State University, 1962

M. A. University of Vermont, 1965

A THESIS

Submitted to the University of New Hampshire

In Partial Fulfillment of

The Requirements for the Degree of

Doctor of Philosophy

Graduate School

Department of Psychology

August, 1970

This thesis has been examined and approved.

G. Alfred Forsyth

Thesis director, G. Alfred Forsyth, Asst. Prof. of Psychology

Raymond L. Erickson

Raymond L. Erickson, Prof. of Psychology

Robert I Watson

Robert I. Watson, Prof. of Psychology

Leslie A. Fox

Leslie A. Fox, Asst. Prof. of Psychology

M. Daniel Smith

M. Daniel Smith, Assoc. Prof. of Education

August 28, 1970

Date

ACKNOWLEDGEMENTS

The author wishes to pay thanks to Mr. T. M. Casey, Dr. G. Niswander, and the entire staff of the New Hampshire Hospital in Concord for their help in the execution of this study. Further thanks go to the faculties and staffs of Little Harbour, the Junior and Senior High Schools of Portsmouth. The late hour help of Mrs. Janet Snow and my wife, Polly, was greatly appreciated. Particular thanks go to my advisor, Dr. G. A. Forsyth, for his invaluable assistance.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (Cont.)

LIST OF FIGURES

ABSTRACT

SELECTIVE ATTENTION BEHAVIOR AS PREDICTED BY ADLER'S SOCIAL INTEREST HYPOTHESIS

by

R. JOHN HUBER

The purpose of this study was to investigate hypotheses generated from Adlerian theory and selective-attention literature concerning the perception of double-aspect, human vs. non-human stimuli. One type of double-aspect, human vs. non-human stimulus was designed so that the stimulus could be seen as a whole face or a non-human object (e.g., face vs. cliff). The second stimulus type was designed to be seen as either a communication organ or a non-human object (e.g., mouth vs. frog). These stimuli were used in the testing of the following hypotheses: (a) perceptual selectivity to human characteristics is positively related to age; (b) communication organ stimuli are more effective discriminators between age and diagnostic groups than whole face stimuli; and (c) perceptual selectivity to human characteristics is negatively related to maladjustment and is related to type of pathology. In an exploratory phase of this study, a factor analytic technique was used to examine the relation of double-aspect, human vs. non-human perception to a number of personality dimensions.

A total of 575 Ss were tachistoscopically exposed to ten double-aspect stimuli in individual sessions. Half of these stimuli had whole faces for the human aspect and half had communication organs for the human aspect. Samples drawn from the 1st, 3rd, 5th, 7th, 9th, and 11th grades of a local school system, from University of New Hampshire students, and from a working population represented the Ss varying in age. Ss with adjustment difficulties were represented by 123 patients (neurotics, sociopaths, and schizophrenics) from the New Hampshire Hospital. In addition to being tested on the perceptual task, the college sample was also given the California Psychological Inventory, the Eysenck Personality Inventory and the Allport-Vernon scale of Values for the factor analytic phase of the study.

Two analyses of variance and subsequent post-mortem analyses supported Adler's social interest hypothesis, since the hypothesis successfully predicted the positive relation of age to human orientation and the negative relation of maladjustment to human orientation in double-aspect selective attention behavior. However, two interactions, Age by Stimulus-type, and Diagnosis by Stimulus-type, indicated that the role of the stimulus is crucial in considering the above-stated relationships. These interactions suggest that a beginning point in research with double-aspect stimuli is the identification of possible significant similarities and differences between perceptual stimuli.

The profiles of the whole face (WF) and communication organ (CO) Stimulus-types across Age and Diagnostic groups should have been similar if they reflected the same construct. Because they were different, a two-factor theory was proposed which held that CO items reflect adjustment and therefore social interest according to Adlerian theory, while WF items reflect the increasing amount of human figures in one's stimulus field as he grows older and not the development of social interest. This two-factor theory accounts for the differentiation between adjusted and maladjusted Ss with CO stimuli but not with WF stimuli. It is also consistent with the observation that both WF and CO stimuli discriminate among age groups, since social interest and amount of human figures in the stimulus field are hypothesized to increase with age.

Interpretations concerning the different constructs related to the perception of WF and CO stimuli could have been supported and clarified by the factor analyses, since different factor loadings would have provided possible explanations for the two interactions. Unfortunately, the correlations between the perceptual task and any personality variable were too low to support any conclusions regarding these differences. If the factor analysis can be improved by increasing the heterogeneity of the sample and increasing the number of perceptual stimuli and thus eliminating truncated distributions which suppress correlations, for example, it may be possible to identify variables related to double-aspect, human vs. non-human perception.

Introduction

The goal of this research was to test predictions concerning selective attention behavior based on Adler's social interest hypothesis that one's understanding of others and one's co-operation with others is positively related to age and adjustment.[1] Research concerning the social interest hypothesis is of import, since the construct is related to several theories of personality and development. This relationship, as well as the breadth and depth of the theory, will be amplified by a discussion of the social interest hypothesis in relation to theories of personality and theories of development. In addition, the selective attention literature relevant to the present experimental task will be reviewed.

The term "social interest" is a translation of the German word Gemeinschaftsgefühl which unfortunately is difficult to translate. Ansbacher and Ansbacher (1964) indicate that social feeling is an acceptable translation of the German term, while in the opinion of this writer,

---

[1]The statements concerning the substance of Adler's social interest hypothesis are this author's interpretation of Adler (1929a, 1929b, 1931, 1956, 1964), and Ansbacher (1963, 1968). When discussing the social interest hypothesis, however, only Adler's name will be cited, since any of the above references are similar in content.

Gemeinschaftsgefühl is best summarized as an empathic co-operative way of life.

It is impossible to understand the concept of social interest without reference to Adler's motivational construct. In Adler's later writings, e.g., Adler (1956), man is seen as striving toward perfection as a result of feelings of incompleteness. Adler calls this striving for superiority, which is very similar to the existential construct of becoming (May, 1961, 1969); Jung's (1959) self-actualization and individuation; and Kelly's (1955) view that life is constant growth and motion. In essence then, to Adler, man is a constantly emerging being.

Adler, therefore, presents a picture of man constantly moving. With man, as with any moving object, it is necessary to state the direction of movement to make any meaningful statement. Social interest is Adler's compass to assess the direction of man's behavior. Ansbacher and Ansbacher (1956) made an apt analogy between social interest, degree of activity, and physical movement. In physics, moving objects are discussed in terms of direction and speed. In relation to man, his degree of activity is analogous to the measure of speed and his degree of social interest is analogous to the direction of physical movement, i.e., how he behaves in regard to others. Does he move with his fellows in an empathic co-operative manner or not?

The social interest principle also means that men are linked with one another. That is, one can only understand an individual's behavior in a social context. Moreno's (1934) concept of the social atom and Sullivan's (1953, p. 111) description of personality as enduring patterns of "interpersonal situations" express the same fundamental idea. Sullivan's (1953) developmental stages exemplify his concern for man's social situation, since all are concerned with different types of interpersonal relationships as opposed to zonal needs. Sullivan, in another sense, is quite Freudian in his thinking, because he repeatedly emphasized the harsh and restrictive nature of society.

While Freud (1917, 1925) primarily concerned himself with man's social situation in a negative sense and concentrated on man's intra-psychic dilemmas related to the reduction of biological needs, there is a rudiment of social interest in the genital stage of his system. It is during this period that the individual first begins to behave in an altruistic manner (Hall, 1954).

Considering Horney's (1945) emphasis on man's interpersonal realm, it can be stated that Horney is more neo-Adlerian than neo-Freudian. Her hypothesis that man moves toward, away, or against others to adjust indicates that, unlike Freud, she considered adjustment an inter-personal process, not an intrapsychic process. Horney's (1945) statements concerning self-actualization were also Adlerian

in nature, since she talked of mature goal orientation as integrally related to an empathic co-operative attitude.

Adler repeatedly stated that social interest involved being able to understand the life style of other people. That is, social interest is related to one's ability to empathize. It is an attitude toward life where one can "see with the eyes of another, hear with the ears of another, and feel with the heart of another" (Adler, 1931, p. 277). This idea is very similar to the existential mode of understanding man as expressed by May (1961, 1969), who stated that it is impossible to understand a human being by forcing him into a pre-conceived theory. Rather, he felt that in order to understand one's manner of living it is necessary to understand that individual's theory of the world by empathizing. In a similar manner, van Kaam (1966) offered the idea that in order to understand behavior it is essential to understand an individual's interaction with the world, i.e., his manner of being-in-the-world.

Jung (1959) also places a strong emphasis on this aspect of human existence. Jung's emphasis on social feeling and maturity is especially evident in his discussion of individuation, that is, self actualization of one's unique capacities. For example, he was careful to distinguish between individuation and individualism.

> Individualism means deliberately stressing and giving prominence to some supposed peculiarity, rather than to collective considerations and

> obligations. But, Individuation means precisely the latter and more complete fulfillment of the collective qualities of the human being since an adequate consideration of the peculiarity of the individual is more conducive to social achievement than when the peculiarity is neglected or suppressed (Jung, 1959, p. 144).

Since individuation, or fulfillment of one's self, is a sign of psychic maturity in Jung's system, Jung, as Adler, seems to be saying that an empathic co-operative life style is the essence of maturity.

Allport and Murray are in fundamental agreement with this view of human development. For instance, Allport (1961) said: "The course of life, broadly speaking, starts in infancy with total dependence progressing in youth to relative independence, and achieving in adulthood a measure of social responsibility [p. 196]." Murray and Kluckhohn (1948) have a similar concept of personality development stating that life consists of the painful transition from an asocial to a social existence.

Jung agreed with Adler in another way in that he felt the capacity to live in an empathic co-operative manner is innate. In other words, Jung felt that an altruistic mode of living is one of man's archetypes. The Bible and God were for Jung (1959) humanizations of this segment of our existence. The Jungian concept of God is very similar to Adler's idea that religion is the sanctification of social interest.

Since archetypes are part of man's genetic inheritance, one can infer that Jung believed social interest to be an innate capacity. There is, however, a crucial difference between Jungian and Adlerian thinking, i.e., Jung felt that there was also an archetype for self-centered, evil behavior, whereas Adler did not. This difference in thinking is representative of Jung's polarity principle and Adler's unitary principle of human behavior.

Adler, like Jung (1959), but unlike Freud (1917), felt that man's social embeddedness was the mainspring of his progress. He (Adler, 1956) often turned to archeology, anthropology, and paleontology, pointing out that with progress man's interdependence increased. Murray and Kluckhohn's (1948) ideas have much in common with Adler's views concerning the benefits of society: "... psychotherapists have probably stressed the repressive and renunciatory demands of culture too much and the benefits too little [p. 6] ..." Adler (1956) felt that for a creature as weak and frail as man, co-operation is a necessity. The archeological historian, V. Gordon Childe, expressed this well, stating:

> It may be equally well inferred that men learned to co-operate and act together in getting their livelihood. A creature so weak and poorly endowed as man could not in isolation successfully hunt the large fierce animals that quite early provided such a necessary part of his diet (Childe, 1936, p. 48).

The Adlerian concept of social interest is also relevant for the development of phylogeny as well as society, thus indicating the breadth of this concept. Hebb, for example, has recently stated that altruistic behavior is innate by citing evidence of infant, unreinforced altruistic behavior (Hebb, 1966a, 1966b; Hebb & Thompson, 1954). Hebb feels that altruistic behavior is positively related to brain development. Therefore, the degree of social interest should increase as one ascends the phylogenetic scale. While further verification of Hebb's hypothesis is needed, the scattered reports of social feeling in animals leave no doubt about the existence of altruistic behavior in sub-human species.

Crawford (1937), for example, demonstrated the existence of social co-operation in chimpanzees by training them to work together to obtain a food reward. A pair of chimps had to co-operate in pulling a heavy box to obtain reinforcement. It is noteworthy that a satiated animal would continue to co-operate so that his partner could obtain food. In a later work, Crawford (1941) was able to train pairs of chimpanzees to press alternately in sequence color coded squares to obtain a food reward. The chimps watched and solicited one another to obtain the correct sequence. As in the 1937 experiment, a member of the team would continue to participate even though previously reinforced with large quantities of food. In one condition of

this experiment only one of the pair received the food reward. On such occasions, Crawford observed that the rewarded chimp voluntarily offered some of the food to his partner thus suggesting social interest. More recently, Masserman et al. (1964) observed that 10 out of 15 rhesus monkeys would rather go hungry than eat, if procuring food meant shocking another monkey. Furthermore, monkeys who had been shocked themselves shocked other monkeys significantly less than monkeys who had not been shocked, thus suggesting the presence of empathy.

Reports of this kind of behavior, however, are not isolated to chimpanzees and monkeys. Elephants, for example, are known to help support an injured member of their pack so he can remain in safety (Siebenaler, 1956). Porpoises also do the same for their injured. In addition, adult porpoises often will assist a young porpoise to surface so that he may breathe. There have even been accounts of porpoises saving human swimmers in distress (Kellog, 1961; Siebenaler, 1956).

The study of social interest is relevant for ontogeny as well as phylogeny, since Adler was convinced that the ability to see with another's eyes was a function of maturity. Piaget's (1932a) research concerning moral realism and nominalism is directly relevant to the above stated hypothesis.

Moral realism is a rigid attitude toward right and wrong. A morally realistic person, for example, feels that the rules of conduct always were and always will be. That is, things are just right or wrong without regard for their appropriateness or inappropriateness. The morally nominalistic person, on the other hand, feels that rules of behavior can be changed any time this change is for the benefit of those involved. Morally nominalistic thinking involves empathy since it involves seeing rules from many vantage points while considering the feelings of others. Piaget found that with an increase in age children become more nominalistic in their thinking.

Piaget's (1932b) description of egocentric and socialized speech is also directly relevant to the hypothesis that social empathy is related to maturity. Egocentric speech is literally talking at others with no intention of conveying meaning or interchanging ideas, while socialized speech is an attempt to share ideas with others and see things from another person's point of view. Piaget observed that the incidence of socialized speech increases as one grows older.

Similarly, Piaget (1931) indicated that children's conceptions of the world become less and less self-bound with an increase in age. For example, as children mature, fewer of them believe that objects like the sun are man-made entities.

Lerner (1937), under the guidance of Piaget, performed work related to empathy and maturity. In one phase of Lerner's research, 112 Swiss boys, ranging in age from 6 to 13 were told a story. In this story one student helped another, even though he had been requested not to give aid, as the student receiving help was lazy. The children were asked if they felt the helper was good or bad, and were then questioned concerning the judgements of the helper's actions from the point of view of the teacher, the helper's mother, and other characters in the story. The younger Ss (approximately age seven) responded in a stereotyped manner; they projected their feelings to the characters in the story. That is, they felt the characters in the story would feel as they did toward the helper. Conversely, older Ss (approximately age ten) said one could not really judge the helper's behavior as good or bad, because it depends on who was looking at the behavior. The older children demonstrated their social interest by realizing that different people perceive the same event differently. Lerner (1937) interpreted the young children's behavior in an Adlerian fashion: "The child's egocentrism manifests itself precisely in terms of a lack of perspective as regards the other person's viewpoint [p. 256]."

Kohlberg (1964, 1966, 1968) has developed Piaget-like ideas which are cogent to the Adlerian social interest hypothesis. Using a question and answer technique similar

to that of Piaget, Kohlberg has studied children's responses to moral puzzles such as: "Should a man steal an illegal drug to save his wife's life?" These answers were judged on 32 basic moral concepts. With this technique Kohlberg found three levels of moral development that are related in a systematic way to six stages of moral development. The three levels are: (a) preconventional (pre-moral); (b) conventional (conventional role conformity); and (c) post-conventional (self-accepted morality). As described by Kohlberg, the shift from preconventional to post conventional morality which occurs with maturation essentially describes the development of social interest, since preconventional is a realistic self-centered morality and post conventional is a nominalistic altruistic morality. A child, for instance, at the preconventional level of moral development might respond to the above stated wife-illegal drug dilemma by saying: "The man should steal the drug to save his wife's life, because he needs her to cook dinner." Someone at the post conventional level might say: "The man should steal the drug because the right to live supersedes all other laws." In this example, the change from a self-centered to an other-centered morality is obvious.

The research of Piaget, Lerner, and Kohlberg is all of a projective nature. That is, the Ss were asked to interpret various vague stimuli. Since one of the major

tenets of Individual Psychology is that an individual's life style is directly related to his schema of apperception, his unique way of perceiving the world, one would expect experiments of a projective nature to be relevant to Adler's maturity and social interest hypothesis.

Considering Adler's emphasis on perception and the Adlerian contentions that: (a) maladjustment is in essence social immaturity; and (b) social interest normally increases with age; it can be hypothesized that: (a) selective attention to the human elements of projective stimuli will be lower for maladjusted Ss than control Ss; and (b) selective attention to the human elements of projective stimuli will increase with age.

Research germane to these two hypotheses has been generated with the Rorschach Plates. Ames et al. (1954), while working with 200 Ss aged 70 to 100, noted that the percentage of human responses to the Rorschach decreased with the onset of senile behavior, but not necessarily with age. Non-senile Ss gave 24% human responses, whereas senile Ss gave 5% human responses. Since, as Coleman (1964) notes, senility is not necessarily based on the deterioration of the central nervous system, it is quite plausible that the decrease in human responses to the Rorschach reflects the deficient social interest of the senile Ss. The research of Ames et al. (1952) supports the hypothesis that social feeling increases with maturity. Ames assessed the responses

to the Rorschach of 650 boys and girls (ages two-ten), noting that there was an increase in human responsiveness with age, ranging from 3% at two years to 16% at ten years. According to Rorschach theory, the percentage of human responses to the Rorschach is indicative of one's interest in social relations (Piotrowski, 1957). The study of Ames et al., therefore, may have indicated increasing interest in social activities as children get older.

Observations made with the Holtzman Inkblots are consonant with Rorschach results. Holtzman (1968) found that institutionalized schizophrenics score significantly lower than normals in number of human responses. Using the Holtzman Blots, Thorpe and Swartz (1966) observed a linear increase with age in the number of human responses of 360 Ss, 120 Ss in each of the first, fourth, and seventh grades.

The greatest amount of research directly relevant to human perceptual orientation and social interest is concerned with the perceptual motor task of figure drawing. This is due in no small extent to Machover's (1949) assertion that people who omitted facial features from their drawings had difficulty with their social contacts. Combining Adler's notion that mental illness is essentially a lack of social interest with Machover's facial hypothesis, one would expect maladjusted Ss to exhibit less facial orientation in their drawings than normal Ss. Quite a

number of investigations support this point of view. In an early study, Brill (1937) compared the drawings of two groups, each consisting of 50 boys institutionalized for mental deficiency. The groups were controlled for age, Binet I.Q., and race. The crucial difference between these groups was their social adjustment at the institution as indicated by supervisors' reports and the Vineland Social Maturity Scale. One of the significant differences between the drawings of the adjusted and maladjusted Ss was the lower score on the mouth and lips for those with adjustment difficulties. Vane and Eisen (1962) have made a similar observation. They scored the drawings of 662 Ss rated poor, fair, and good in school adjustment by their teachers. Omission of the mouth was a significant discriminator between these groups. The group rated poor made the greatest number of omissions. Similarly, Koppitz (1966a) also found facial omissions to discriminate between disturbed and non-disturbed children. In addition to omissions of the mouth, Koppitz found omission of the eyes and nose in drawings to be indicative of pathology.

As might be expected from the above research, facial emphasis in drawings differentiates between hospitalized and non-hospitalized Ss. Holzberg and Wexler (1950, 1952), for example, found that student nurses, as compared to hospitalized schizophrenics, were significantly more accurate in their depiction of facial detail in figure

drawings. The nurses also emphasized the lips, shaded the mouth, and drew smiling mouths more than schizophrenics. Baldwin (1964) has also observed that normals pay more attention to the head in their drawings than do institutionalized schizophrenics. Hiler and Nesvig (1965), using patients of several diagnostic classifications, found distortion of the head to significantly differentiate normals from Ss with behavioral disorders.

Handler and Rehyer (1964), dissatisfied with correlational type studies, investigated the effect of experimentally produced anxiety on human figure drawing. Employing a repeated-measures design, they required Ss to draw a human figure in a stress and non-stress situation, with the presence of E constituting the stress condition. The head was significantly simplified in the anxiety-producing situation.

Since lack of attention to the face and facial detail are signs of pathology, one would expect these signs to diminish with improvement in psychotherapy. The evidence for this assumption is meager but positive. Margolis (1948), in a case study, reported that the eyes and other facial features became more prominent in her client's drawings as he progressed in psychotherapy. Similarly, Fiedler and Siegel (1949) found that neurotics who improved in therapy received significantly higher facial scores on the Goodenough draw-a-man Test than those who had not improved in therapy.

There have been few studies with the specific goal of studying the relationship between facial attention on the draw-a-person test and one's degree of social interest. Richey and Spotts (1959) found a modest but significant correlation between the facial scores on the Goodenough and sociometric ratings of popularity of midwestern fifth graders. The correlation was so low, however, the authors felt their finding was of little practical application. Stone and Ansbacher (1965) felt that the correlation of Richey and Spotts was low because they did not concentrate on the essential indicators of social feeling. Stone and Ansbacher felt that the eyes, nose, and ears, as opposed to the whole face, were the essential factors in facial drawing related to social interest, because these parts of the face are used in communicating with others more than the rest of the face. Furthermore, Stone and Ansbacher used the social skills scale of the California Test of Personality, which they felt was more related to the Adlerian concept of social feeling than a sociometric rating of popularity. Using fourth grade children as Ss, the above investigators obtained a correlation of .73 between the communication organ score (score on eyes, ears, nose, and mouth) and the California sub-scale for social feeling whereas the head score only correlated .47 with the sub-test. Strümpfer and Huysamen (1968), however, found only a modest correlation between the communication organ score and social interest factors on Cattell's High School Personality Questionnaire.

Based on research such as the above-cited perceptual studies, as well as Adler's contentions that maladjustment is in essence social immaturity, and that social interest normally increases with age, Huber and Stiggins (1970) conducted a study that involved two predictions: (a) the better adjusted individual would perceive a double-aspect stimulus (human vs. non-human) as a social (human) stimulus more often than the maladjusted individual; and (b) the younger child, like the maladjusted adult, is less likely to perceive a double-aspect stimulus as human.

There were two purposes of the Huber and Stiggins (1970) study. The first was to compare the response style of first, third, fifth, seventh, and twelfth graders on three double-aspect stimuli: (a) vase vs. face; (b) ear vs. question mark; and (c) mountain vs. face. The authors predicted that the number of human responses would increase with age according to the social interest hypothesis. The second purpose of the investigation was to compare the response style of normal and pathological Ss on the double-aspect stimuli described above. This phase of the study was designed to test the hypothesis that maladjusted Ss would perceive the double-aspect figures as human significantly less often than normal Ss, as predicted by the social interest construct.

The results of Huber and Stiggins (1970) tentatively supported the two hypotheses. As with most research,

however, more questions were raised than answered. The purpose of the present study, therefore, was to investigate further the hypotheses explored in the study of Huber and Stiggins using the areas for future research suggested in their 1970 paper, namely: (a) an increase in age levels; (b) a systematic study of the role of the stimulus; (c) an analysis of inter-diagnostic category differences for pathological Ss; and (d) an investigation of related personality variables.

While no obvious linear trend was observed in the Huber and Stiggins (1970) investigation, significant differences in the predicted direction were observed between the oldest group and both of the two youngest groups. Therefore, further research with adults was warranted. Many investigators, for example Jung (1959), and Bernard (1967), have stated that one becomes increasingly co-operative and empathic until at least middle-age, or early old age. Studies of this nature are needed, since psychologists have neglected to study the development of adults.

Huber and Stiggins observed a person-by-stimulus interaction in their 1970 study. It was necessary, therefore, to investigate systematically the role of the stimulus in the present study. More specifically, Stone and Ansbacher's (1965) hypothesis, that attention to communication organs (nose, ears, eyes) is a better indicator of social interest than attention to the entire face, was tested.

Huber and Stiggins (1970) observed differences in perception between different diagnostic groups in their pathological sample. Sociopaths, for example, gave 25% predominantly human responses, whereas schizophrenics gave only 9% predominantly human responses. Their sample, however, was too small for statistical analysis. In the present study, inter-diagnostic category differences were investigated with ns large enough to permit statistical analysis.

While considering the differences between sociopaths and schizophrenics, Huber and Stiggins indicated the possibility that double-aspect, human vs. non-human perception was related to more than social interest. Specifically, they felt it was possible that this task was related to introversion-extroversion, since sociopaths are of an extroverted nature and schizophrenics are of an introverted nature. This is in accord with Koppitz' (1966b) finding that attention to the mouth, eyes, and nose in figure drawings differentiated aggressive children with behavior problems from shy children with behavior problems. Considering this, it seemed clear that research should be conducted to ascertain the relationship between double-aspect perception and personality variables.

In summary, the purpose of this study was to investigate the following hypotheses: (a) perceptual selectivity to human characteristics is positively related to age; (b) communication organ stimuli are better

discriminators between age and diagnostic groups than whole face stimuli; and (c) perceptual sensitivity to human characteristics is negatively related to maladjustment and is related to type of pathology. In an exploratory phase of this study, a factor analytic technique was used to examine the relation of the double-aspect perceptual dependent variable to a number of personality dimensions.

METHOD

Subjects

A total of 575 Ss participated in this study. Three hundred of these were students from the Portsmouth, New Hampshire City Schools. Specifically, 50 students (25 males and 25 females) per grade were drawn randomly from the first, third, fifth, seventh, ninth, and eleventh grades. An additional 102 Ss (51 males and 51 females) were drawn from Introductory Psychology classes at the University of New Hampshire. Ninety-six of the college sample were used as Ss in the factor analytic phase of this study. Six of the college sample were not included in the factor analysis because of incomplete data. Fifty more Ss (30 males and 20 females) represented a sample of working people. All working Ss were over 25 years of age with a mean age of 45.66 years. Nineteen of these people were employed by business concerns in Durham, New Hampshire; 31 were teachers at the Portsmouth Senior High School.

Another group of Ss were 123 patients from the New Hampshire State Hospital in Concord. They had been diagnosed by the hospital staff as: 50 schizophrenics (25 males and 25 females, mean age 52.34 years); 46 sociopaths (30 males and 16 females, mean age 36.15 years); and 27 neurotics (8 males and 19 females, mean age 46.96 years). The 30 males and 20 females representing the working sample previously mentioned served as controls for institutionalized Ss.

Stimuli, Apparatus, and Testing Material

The articles of equipment used in this experiment were ten stimulus cards, an overhead projector, a portable screen, the California Psychological Inventory, the Allport-Vernon Study of Values, and the Eysenck Personality Inventory.

In a pilot study, 166 students enrolled in Introductory Psychology were used to expand and refine the stimuli used by Huber and Stiggins (1970). The cards were double-aspect stimuli which could be seen as human or non-human. The human dimension of the double-aspect stimuli were subdivided into two parts: half were designed to represent whole faces (WF), and half were designed to represent communication organs (CO). Stimulus 1, an adaptation of Rubin's (1915) familiar vase-face drawing, is representative of a WF stimulus; and Stimulus 6, the question-ear of Huber and Stiggins (1970), is representative of a CO stimulus. (See Appendix.) The other eight stimuli are pictured and identified in the Appendix. The 166 pilot Ss were used

to ascertain whether the two designated aspects, such as ear vs. question mark, could be seen in each stimulus. Each drawing was modified until approximately half of the Ss gave human and half gave non-human responses. The number of Ss used to standardize each stimulus varied since it was necessary to change several pictures during experimentation to equalize dominance of both aspects of the sketch. The percentage of human and non-human responses and the n for each card are presented in Table 1. From this table one can see that the average probability of human responses is approximately the same for the five CO items and the five WF items. The origin of each stimulus is cited in Table 1. Where no citation appears, the stimulus is the creation of the writer in collaboration with colleagues.

An overhead projector was used to flash an 18 inch by 26 inch image of each stimulus on a portable screen for one second.

Three tests comprised the battery for the factor analysis mentioned in the Introduction. The tests were: (a) the California Psychological Inventory (CPI); (b) the Allport-Vernon Study of Values; and (c) the Eysenck Personality Inventory (EPI). These tests were chosen because of their acceptable degree of validity and reliability, their relation to social interest and extroversion-introversion, and their suitability for the heuristic, or exploratory function, of the factor analysis that was conducted.

TABLE 1

PERCENTAGE OF H AND NH RESPONSES
TO DOUBLE-ASPECT STIMULI MADE
BY PILOT COLLEGE *Ss*

WF Stimuli		CO Stimuli	
Rat-Man (Bugelski & Alampay, 1961)	.70 H .30 NH *n*= 98	Frog-Mouth	.62 H .38 NH *n*=124
Rabbit-Pirate (Leeper, 1935)	.60 H .40 NH *n*=124	Squirrel-Ear	.58 H .42 NH *n*=125
Cliff-Face	.57 H .43 NH *n*=106	Mountain-Mouth	.58 H .42 NH *n*=127
Dog-Chef (Wallach & Austin, 1954)	.45 H .55 NH *n*= 51	Question-Ear	.54 H .46 NH *n*= 39
Vase-Face (After Rubin, 1915)	.37 H .63 NH *n*= 97	Cliff-Nose	.45 H .55 NH *n*= 38
$\bar{X}$ WF	.54 H .46 NH	$\bar{X}$ CO	.55 H .45 NH

The CPI was most suitable for the heuristic function, since it had a large number of valid and reliable sub-scales. Including check scales, there are 18 measures on this test. In addition to serving a heuristic function, however, there are scales relevant to the investigation of social interest and introversion-extroversion. In particular, the descriptions of those scoring high on the socialization, good impression, and communality scales appear to describe the socially interested individual. Also, the descriptions of those who score high on the dominance, capacity for status, and sociability scales appear to describe the extroverted individual (Gough, 1957).

The social scale was the primary reason for choosing the Allport-Vernon Test. Allport's (1960) description of his narrowing of Spranger's (1928) depiction of the social man seemed quite applicable to the concept of social interest, since Allport felt the revised social scale taps the philanthropic altruistic aspect of one's existence. Since concern for the sociopath's style of responding to the double-aspect perceptual task was expressed in the introduction, the political scale is quite important, because of its relationship to seeking power for the sake of power. The remaining scales, naturally, were important for the heuristic aspect of the analysis.

The EPI (Eysenck, 1963) was chosen for its two scales--the extroversion-introversion scale and the neuroticism scale (general adjustment). The extroversion scale

was useful in assessing the assumption that extroversion-introversion is related to double-aspect, human vs. non-human perception. The general adjustment scale is useful, since, according to Adler, social interest and adjustment are intimately related.

Procedure

The CPI, the Allport-Vernon, and the EPI were administered in a group session to the college Ss. The college sample were the only Ss available for group testing.

For the perceptual task, all Ss were brought individually into the experimental room and placed eight feet from a portable screen. They were then instructed: "I am going to show some pictures on the screen in front of you. Your job is to tell me what you see in the pictures--what the pictures look like to you. Do you understand? Let's try one just for practice. Here is the first picture." The first item, a pencil pictured in the Appendix, was presented so S could acclimate to the experimental task. These instructions were modified for first and third graders by inserting the following sentence in front of the above quoted instructions: "Today we are going to play a game." Ss' responses were scored as either human (H = face, ear, mouth, or any facial part), or non-human (NH = vase, question mark, dog, or anything else non-human). The order of

presentation was reversed 50% of the time to counterbalance for position and order effects.

Buffer stimuli of an obvious and neutral nature, pictured in the Appendix, were interspersed to break set (such as human) and make insight regarding the purpose of the experiment more difficult for S. In addition, all Ss were questioned concerning set and insight at the end of the session. All participants, for example, were asked: "Did you look for anything special when you looked at these pictures? Did you look for certain kinds of things?" It was necessary to eliminate five college Ss because of set. Specifically, these five Ss reported an expectation for human stimuli. One high school student and one patient were eliminated because they were unable to state whether the vase or face was their most dominant impression. Finally, seven patients were eliminated because their illness made it impossible for them to respond.

RESULTS

Analysis of Variance I

For this analysis, an 8 x 2, Age category by Stimulus-type, analysis of variance with repeated measures on the Stimulus-type variable was calculated. That is, the responses to WF and CO stimuli by first, third, fifth, seventh, ninth, and eleventh graders, college students, and adults, were analyzed. For the college sample, $n = 102$, and

for each other group n = 50. An unweighted means solution recommended by Winer (1962) was used in the analysis. The means for each treatment condition and the analysis of variance are summarized in Tables 2 and 3 respectively.

As can be seen in Table 3, the significant Age by Stimulus interaction, F = 5.036, df = 7/444, $p < .005$, qualified the effect associated with Age. Consequently, an analysis of simple main effects was carried out, the results of which are presented in Table 4. This analysis indicated that the Stimulus factor was significant at some Age levels; specifically, first graders scored significantly higher on CO items, while fifth graders and adults scored significantly higher on WF items. The analysis of simple main effects also revealed significant variability as a function of Age for both WF and CO stimuli; F = 16.180, df = 7/888, $p < .005$ for Age at WF, and F = 4.555, df = 7/888, $p < .005$ for Age at CO. The larger F value, however, for the WF stimuli suggested that the significant Age by Stimulus-type interaction resulted from greater variability accounted for by Age with WF stimuli than with CO stimuli. Further support for this notion is reflected in Figure 1 which plots H responsiveness as a function of Age for WF and CO stimuli. An inspection of means in Table 2 and Figure 1 suggested that a difference in the linear trend of H responsiveness across Age was a major component of the Age by Stimulus-type variability. That is to say, the slope of H responsiveness

TABLE 2

MEAN NUMBER OF H RESPONSES TO WF AND CO STIMULI BY Ss OF DIFFERENT AGE CATEGORIES

Age Categories	Stimuli	
	WF	CO
1st grade	1.14	1.94
3rd grade	1.98	2.32
5th grade	2.34	1.88
7th grade	2.78	2.56
9th grade	2.24	2.26
11th grade	2.86	2.88
College	2.68	2.41
Adult	3.06	2.50

TABLE 3

ANALYSIS OF VARIANCE OF MEAN NUMBER OF H RESPONSES TO WF AND CO STIMULI BY *Ss* OF DIFFERENT AGE CATEGORIES

Source	df	MS	F
Between Ss	451		
Age (A)	7	20.693	14.212***
SSe	444	1.456	
Within Ss	452		
Stimuli (B)	1	.373	.355
A X B	7	5.288	5.036***
B X SSe	444	1.050	

*** $p < .005$.

TABLE 4

ANALYSIS OF VARIANCE FOR SIMPLE MAIN EFFECTS
OF AGE CATEGORIES AND STIMULUS TYPES

Source	df	MS	F
Age (WF)	7	20.274	16.180***
Age (CO)	7	5.707	4.555***
Pooled error	888	1.253	
Stimulus (1st)	1	17.067	16.254***
Stimulus (3rd)	1	3.093	2.946
Stimulus (5th)	1	5.870	5.950*
Stimulus (7th)	1	1.280	1.219
Stimulus (9th)	1	.000	0
Stimulus (11th)	1	.000	0
Stimulus (Col.)	1	1.973	1.879
Stimulus (Adult)	1	8.373	7.974***
Stimulus x SSe	444	1.050	

* $p < .05$.
*** $p < .005$.

TABLE 5

TREND ANALYSIS OF AGE BY STIMULUS INTERACTION ASSOCIATED WITH DIFFERENCES IN SIMPLE MAIN EFFECTS OF AGE

Source	df	MS	F
Age x Stimulus Linear	1	12.223	11.641***
Age x Stimulus Quadratic	1	5.503	5.261*
Age x Stimulus Cubic	1	7.482	7.126**
Age x Stimulus Quartic	1	1.481	1.410
Stimulus x SSe	444	1.050	

* $p < .05$.
** $p < .01$.
*** $p < .005$.

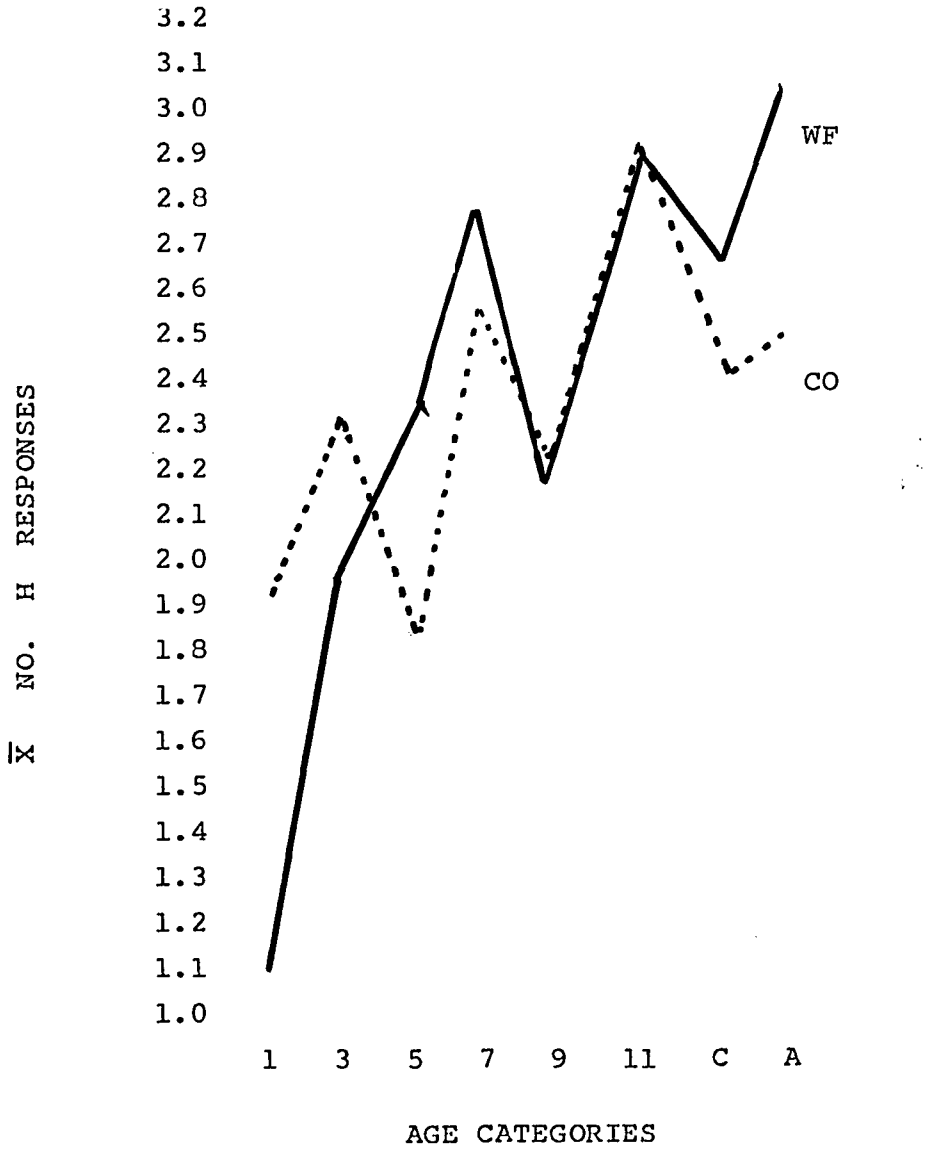


Figure 1. Comparison of age trends with WF (-) and CO (--) items.

across Age appeared to be steeper with WF items than with CO items. Thus, a trend analysis, summarized in Table 5, was carried out to evaluate this relationship.

As indicated in Table 5, the greatest portion of Age by Stimulus interaction was related to a difference in the linear component of the simple main effects of Age. The linear component of the simple main effects accounts for 42% of the Age category by Stimulus-type variability.

If the WF and CO conditions are regarded as two separate experiments in calculating the linear components of the Age factor, the greater linearity of H responsiveness across Age with WF items can be demonstrated. A linear function accounted for 71% of the variability associated with Age using WF items and 42% of the variability associated with Age using CO items. This statement is amplified by noting that there is a greater amount of variability accounted for by Age at the WF condition.

The significance of the quadratic component, as can be seen in Figure 1, was a result of the greater negative acceleration of H responsiveness associated with Age categories on CO items. The cubic component of the Age by Stimulus-type interaction was significant, since the cubic trends with CO and WF items are of an opposite nature. (See Figure 1.) This difference in trend was reflected in the sum of products of the polynomials times the Age level means. The positive sum of products for WF Age means indicated an up-down-up cubic trend; whereas the negative

sum of products for CO Age means indicated a down-up-down cubic trend. The functional relation of Age and H responsiveness with CO items beyond linearity, however, is essentially uninterpretable since there are seven directions to the curve plotted for Age in Figure 1 for this treatment level.

Single comparison post-mortem tests recommended for unequal cell size were calculated (Winer, 1962) and further supported this interpretation of the interaction. When comparing the effect of Age using WF items, among the significant differences noted were differences between: the first and third; the third and fifth; the fifth and seventh; the seventh and ninth; and the ninth and eleventh grades; as well as between college students and adults. With the exception of the change from the seventh to the ninth grade, these differences all represent increases in H responses, thus reflecting the overall linear trend illustrated in Figure 1 and demonstrated with the trend analysis. The individual comparisons for Age using CO items, however, indicated at least five significant changes in direction between the various Age groups. The effect of Age at CO is best interpreted as a scalloped linearity.

In the discussion of this interaction the magnitude of the difference between the first grade and the adult sample at both stimulus conditions should not be overlooked (WF, $\underline{F} = 146.869$, $\underline{df} = 1/888$, $\underline{p} < .005$; CO, $F = 12.444$, $\underline{df} = 1/888$, $\underline{p} < .005$). The tabled $\underline{F}$ at the .005

level with df = 1/ = 7.879. All of the individual comparisons are presented in Table 6.

Analysis of Variance II

A 4 x 2, Diagnosis by Stimulus-type analysis of variance with repeated measures on the Stimulus-type variable was carried out to assess the relationship between the responses of 50 schizophrenics, 46 sociopaths, 27 neurotics, and 50 adults to WF and CO stimuli. Because of the unequal cell samples, Winer's (1962) unweighted means solution was again employed. The means for each treatment condition and the analysis of variance are summarized in Tables 7 and 8 respectively.

Significant main effects were observed for both the Diagnosis, $F = 3.394$, df = 3/169, $p < .005$, and Stimulus-type, $F = 66.925$, df = 1/169, $p < .005$. The Diagnosis by Stimulus-type interaction, however, approached significance at the .05 level, $F = 2.345$, df 3/169, $.05 < p < .10$, so an analysis of simple main effects was carried out to examine the nature of the effect of each variable at specific levels of the other variable involved. The results of the analysis are presented in Table 9. It would be unwise, considering this analysis, to interpret the effect of either variable without specifying the level of the other variable. Inspection of Figure 2 supports this conclusion. Although all Ss scored lower on CO items, the effect was most pronounced for the institutionalized sample. In addition, Diagnostic category was a significant

TABLE 6

POST MORTEM Fs ON SIMPLE MAIN EFFECTS OF AGE

AGE (WF)	df = 1/888	AGE (CO)
1st vs. 3rd	F = 28.172***	1st vs. 3rd F = 5.753*
1st vs. 5th	F = 57.371***	1st vs. 5th F = 0.143
1st vs. 7th	F = 107.155***	1st vs. 7th F = 15.315***
1st vs. 9th	F = 48.207***	1st vs. 9th F = 4.080*
1st vs. 11th	F = 117.865***	1st vs. 11th F = 35.283***
1st vs. Col.	F = 126.824***	1st vs. Col. F = 11.813***
1st vs. Adult	F = 146.869***	1st vs. Adult F = 12.494***
3rd vs. 5th	F = 5.163*	3rd vs. 5th F = 7.713**
3rd vs. 7th	F = 25.498***	3rd vs. 7th F = 2.295
3rd vs. 9th	F = 2.693	3rd vs. 9th F = 0.143
3rd vs. 11th	F = 30.853***	3rd vs. 11th F = 12.494***
3rd vs. Col.	F = 26.203***	3rd vs. Col. F = 0.433
3rd vs. Adult	F = 46.470***	3rd vs. Adult F = 1.291
5th vs. 7th	F = 7.713**	5th vs. 7th F = 18.422***
5th vs. 9th	F = 0.398	5th vs. 9th F = 5.753*
5th vs. 11th	F = 10.773***	5th vs. 11th F = 39.841***
5th vs. Col.	F = 6.182*	5th vs. Col. F = 15.021***
5th vs. Adult	F = 20.653***	5th vs. Adult F = 15.315***
7th vs. 9th	F = 11.618***	7th vs. 9th F = 3.586
7th vs. 11th	F = .255	7th vs. 11th F = 4.080*
7th vs. Col.	F = .535	7th vs. Col. F = 1.203
7th vs. Adult	F = 3.124	7th vs. Adult F = 0.143
9th vs. 11th	F = 15.315***	9th vs. 11th F = 15.315**
9th vs. Col.	F = 10.353***	9th vs. Col. F = 1.203
9th vs. Adult	F = 26.789***	9th vs. Adult F = 2.295
11th vs. Col.	F = 1.732	11th vs. Col. F = 11.813***
11th vs. Adult	F = 1.594	11th vs. Adult F = 5.753*
Col. vs. Adult	F = 7.722**	Col. vs. Adult F = 0.433

* $p < .05$.
** $p < .01$.
*** $p < .005$.

TABLE 7

MEAN NUMBER OF H RESPONSES TO WF AND CO STIMULI BY *Ss* OF DIFFERENT DIAGNOSES

Diagnoses	WF	CO
Schizophrenic	2.86	1.58
Neurotic	2.92	1.78
Sociopath	2.74	2.04
Adult	3.06	2.50

TABLE 8

ANALYSIS OF VARIANCE OF MEAN NUMBER OF H RESPONSES TO WF AND CO STIMULI BY Ss OF DIFFERENT DIAGNOSES

Source	df	MS	F
Between Ss	172		
Diagnosis (A)	3	4.700	3.394*
SSe	169	1.385	
Within Ss	173		
Stimuli (B)	1	68.397	66.925***
A x B	3	2.397	2.345 +
B x SSe	169	1.022	

\+ $.10 > p > .05$.

* $p < .05$.

*** $p < .005$.

TABLE 9

ANALYSIS OF VARIANCE FOR SIMPLE MAIN EFFECTS OF DIAGNOSIS AND STIMULUS

Source	df	MS	F
Diagnosis (WF)	3	.713	.592
Diagnosis (CO)	3	6.370	5.291***
Pooled error	338	1.204	
Stimulus (schizophrenic)	1	33.128	32.415***
Stimulus (neurotic)	1	26.260	25.695***
Stimulus (sociopath)	1	9.898	9.685***
Stimulus (adult)	1	6.343	6.206*
Stimulus x SSe	169	1.022	

* $p < .05$.
*** $p < .005$.

TABLE 10

POST MORTEM Fs ON SIMPLE MAIN EFFECTS OF DIAGNOSIS USING CO ITEMS

Diagnosis	df = 1/338
Adult vs. Schizophrenic	F = 35.120***
Adult vs. Neurotic	F = 15.114***
Adult vs. Sociopath	F = 8.397***
Sociopath vs. Schizophrenic	F = 8.397***
Sociopath vs. Neurotic	F = 1.910
Neurotic vs. Schizophrenic	F = 1.163

*** $p < .005$.

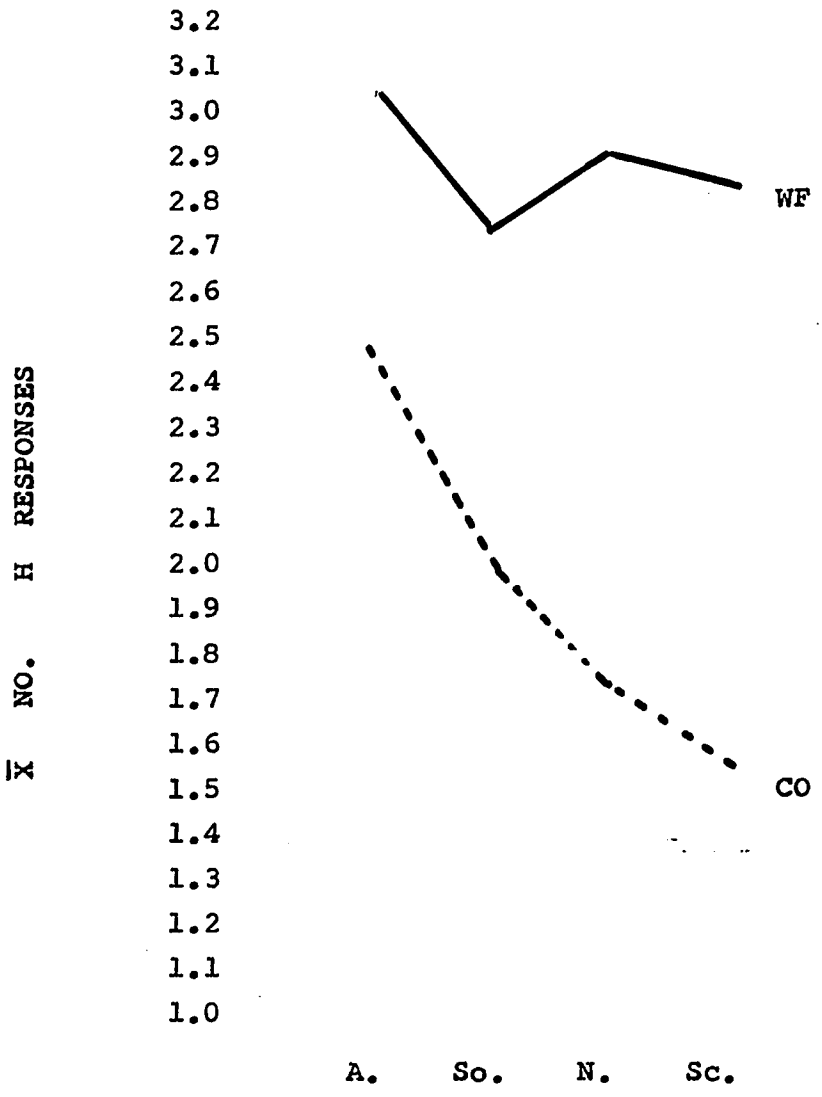


Figure 2. Comparison of diagnostic trends with WF (-) and CO (--) items.

variable only with CO items, i.e., only CO items effectively discriminated between patients and normals, $F = 5.291$, $df = 3/338$, $p < .005$. For Diagnostic categories with WF items, $F = .592$, $df = 3/338$, $p > .05$.

Individual comparison, post-mortem tests recommended for unequal cell frequency were computed (Winer, 1962) for Diagnosis with WF items and indicated that the adult (normal) sample was significantly higher in H responsiveness than all pathological groups. The sociopathic sample, moreover, was found to be significantly higher in H responsiveness than the schizophrenic sample. (See Table 10 for individual comparisons.)

Factor Analysis

Three principal component factor analyses were calculated. Six scores from the Allport-Vernon Scale of Values, 18 scores from the CPI, two scores from the EPI, and the total score from the double-aspect task were used to form the correlation matrix for one analysis. The other two analyses were the same except for the substitution of WF scores for total scores in one and the substitution of CO scores for total scores in the other.

The main goal of these analyses was to discover personality variables related to double-aspect, human vs. non-human perception. This goal was not achieved since there were no substantial correlations of any of the personality variables with the perceptual task. For example, the

highest correlations for the total scores, WF scores, and CO scores were: -.197 between femininity and the total perceptual score; -.245 between femininity and the WF score; and -.316 between economic and CO score. There were, moreover, many extremely low correlations such as .05. The lack of relationship between the perceptual task and the personality variables on the various paper and pencil tests is shown in Table 11, where the correlations between the perceptual scores and the traits described in the Introduction are listed. This lack of correlation indicates that the perceptual task is likely to be a factor in itself.

This is supported by the observation that factors on which the perceptual variable typically loaded were factors on which few other variables loaded. There were, however, several scales which correlated with each other quite highly (especially CPI scales). There were, therefore, some factors where several variables loaded heavily. All factors with eigen values greater than one are presented in the three rotated (varimax) matrices presented in Tables 12, 13, and 14. Even though the factor analyses revealed little concerning double-aspect perception, several of the emergent factors are of interest in themselves. These factors, therefore, are briefly described in the following paragraphs.

In Table 12, there are seven factors. Factor 1, primarily consisting of high CPI scale loadings, was

TABLE 11

CORRELATION OF VARIABLES DESCRIBED IN METHOD AS RELEVANT TO SOCIAL INTEREST AND EXTROVERSION WITH TOTAL, WF, AND CO PERCEPTUAL SCORES

Test		Variable	Total	WF	CO
Allport	Social Interest	Social	-.035	.065	-.009
Allport		Political	-.106	.019	-.177
CPI		Socialization	.032	-.026	-.023
CPI		Good Impression	.024	-.099	.131
CPI		Communality	.044	.181	-.106
EPI		Neurosis	-.143	-.054	-.163
EPI	Extro-version	Extroversion	.015	.099	-.072
CPI		Dominance	-.013	.048	-.066
CPI		Capacity for status	.152	.012	.216
CPI		Sociability	.058	.029	.058

TABLE 12

ROTATED FACTOR LOADINGS WITH TOTAL PERCEPTUAL SCORE AS VARIABLE 27

Variable	Factor I Extro.-Intro.	Factor II Enterprise-Become	Factor III Eco.-Pol.-Non-Rel.
1. Theoretical	-.049	.289	.116
2. Economic	-.080	-.179	.433*
3. Aesthetic	.183	-.008	-.131
4. Social	-.133	.089	-.125
5. Political	.143	.090	.764*
6. Religious	-.018	-.102	-.868*
7. Dominance	.814*	.217	.091
8. Capacity Status	.763*	.370	-.030
9. Sociability	.905*	.148	-.085
10. Social Presence	.861*	.149	.042
11. Self Accept.	.853*	.048	.124
12. Sense Well Being	.328	.738*	-.044
13. Responsibility	-.065	.565*	-.213
14. Socialization	-.086	.354	-.051
15. Self Control	-.348	.816*	-.087
16. Tolerance	.275	.818*	.026
17. Good Impression	.066	.737	-.170
18. Communality	.115	-.031	.033
19. Achieve Conformity	.115	.721*	.108
20. Achieve Independence	.139	.715*	.048
21. Intellect. Efficiency	.470	.741	.104
22. Psychological Minded	.218	.689*	.132
23. Flexibility	.242	.140	.064
24. Femininity	-.182	.088	-.275
25. Extro.Intro.	.781*	-.156	.037
26. Neurotic	-.462	-.477*	-.101
27. Total Perceptual	.036	.015	-.028

*Described in text.

TABLE 12 (Cont.)

Variable	Factor IV Non-Theo,-Social	Factor V Protes-tant	Factor VI Percep-tual	Factor VII Eco.-Non-Aes.-Non-Fem.
1. Theoretical	-.496*	-.339	.183	.068
2. Economic	.287	.426*	-.131	.427*
3. Aesthetic	-.164	-.206	.236	-.747*
4. Social	.901*	-.026	-.077	.060
5. Political	-.102	.033	-.205	.235
6. Religious	.063	.110	-.184	-.008
7. Dominance	-.034	.037	-.110	-.015
8. Capacity Status	-.063	-.016	.086	-.170
9. Sociability	-.098	.036	-.008	-.031
10. Social Presence	-.069	-.165	.175	-.011
11. Self Accept.	-.002	.019	-.053	-.150
12. Sense Well Being	-.108	.204	.128	.070
13. Responsibility	.214	.449*	-.171	.170
14. Socialization	.113	.771*	.024	.056
15. Self Control	-.001	.124	-.050	.070
16. Tolerance	.189	.028	.059	-.130
17. Good Impression	-.109	-.066	-.038	.231
18. Communality	.145	.848*	.071	-.047
19. Achieve Conformity	-.125	.440*	-.094	.023
20. Achieve Independence	.189	-.147	.055	-.362
21. Intellect. Efficiency	.051	-.064	.107	-.147
22. Psychological Minded	-.158	-.291	-.041	-.185
23. Flexibility	.322	-.695*	-.004	-.250
24. Femininity	.164	.209	-.405	-.663*
25. Extro.Intro.	.137	-.085	.058	.198
26. Neurotic	.278	-.004	-.247	-.237
27. Total Perceptual	.020	.034	.879*	-.077

*Described in text.

TABLE 13

ROTATED FACTOR LOADINGS WITH WF PERCEPTUAL SCORE AS VARIABLE 27

Variable	Factor I Extro-Intro.	Factor II Enterprise-Become	Factor III Eco.-Pol.-Non-Rel.-Non-Aes.
1. Theoretical	-.057	.308	.060
2. Economic	-.102	-.184	.547
3. Aesthetic	.262	.018	-.386
4. Social	-.145	.093	-.139
5. Political	.140	-.102	.860
6. Religious	-.049	-.135	-.743
7. Dominance	.807	.215	.105
8. Capacity Status	.775	.378	-.071
9. Sociability	.898	.150	-.077
10. Social Presence	.858	.167	.004
11. Self Accept.	.866	.050	.092
12. Sense Well Being	.319	.750	-.063
13. Responsibility	-.057	.552	-.226
14. Socialization	-.079	.352	-.029
15. Self Control	-.362	.805	-.045
16. Tolerance	.281	.825	-.033
17. Good Impression	.077	.722	-.050
18. Communality	.143	-.017	-.023
19. Achieve Conformity	.115	.718	.121
20. Achieve Independence	.171	.720	-.060
21. Intellect. Efficiency	.482	.751	.041
22. Psychological Minded	.227	.685	.107
23. Flexibility	.250	.138	.006
24. Femininity	-.134	.059	-.348
25. Extro.Intro.	.756	-.149	.070
26. Neurotic	-.443	-.495	-.123
27. WF Perceptual	.086	-.093	-.043

TABLE 13 (Cont.)

Variable	Factor IV Protes-tant	Factor V Non-Theo.-Social	Factor VI Perceptual
1. Theoretical	-.350	.509	.194
2. Economic	.481	.281	.193
3. Aesthetic	-.362	.123	-.365
4. Social	-.031	-.879	.149
5. Political	.058	.087	-.055
6. Religious	.201	-.039	-.132
7. Dominance	.052	.020	-.018
8. Capacity Status	-.046	.055	-.067
9. Sociability	.043	.105	.007
10. Social Presence	-.190	.086	.137
11. Self Accept.	-.001	-.025	-.089
12. Sense Well Being	.198	.119	.130
13. Responsibility	.450	-.240	-.214
14. Socialization	.762	-.107	-.071
15. Self Control	.153	.002	-.043
16. Tolerance	-.005	-.188	-.065
17. Good Impression	.007	.134	.065
18. Communality	.797	-.170	.017
19. Achieve Conformity	.443	.114	-.093
20. Achieve Independence	-.211	-.224	-.220
21. Intellect. Efficiency	-.102	-.067	-.032
22. Psychological Minded	-.303	.122	-.167
23. Flexibility	-.724	-.314	-.163
24. Femininity	.176	-.235	-.682
25. Extro.Intro.	-.063	-.096	.227
26. Neurotic	-.006	-.314	-.267
27. WF Perceptual	.120	-.130	.705

TABLE 14

ROTATED FACTOR LOADINGS WITH CO PERCEPTUAL SCORE AS VARIABLE 27

Variable	Factor I Extro.- Intro.	Factor II Enterprise- Become	Factor III Eco.-Pol.- Non-Rel.	Factor IV Protes- tant
1. Theoretical	-.048	.286	.087	-.346
2. Economic	-.092	-.153	.410	.409
3. Aesthetic	.202	-.042	-.068	-.170
4. Social	-.134	.084	-.126	-.012
5. Political	.132	-.084	.753	.027
6. Religious	-.016	-.092	-.871	.090
7. Dominance	.824	.221	.080	.001
8. Capacity Status	.765	.361	-.019	-.015
9. Sociability	.906	.145	-.092	.031
10. Social Presence	.852	.132	.053	-.129
11. Self Accept.	.865	.048	.119	-.013
12. Sense Well Being	.324	.734	-.030	.221
13. Responsibility	-.041	.584	-.226	.381
14. Socialization	-.093	.368	-.044	.783
15. Self Control	-.346	.821	-.077	.108
16. Tolerance	.282	.808	.038	.027
17. Good Impression	.055	.737	-.163	-.063
18. Communality	.119	-.012	.034	.840
19. Achieve Conformity	.122	.735	.100	.407
20. Achieve Independence	.161	.704	.061	-.180
21. Intellect. Efficiency	.478	.732	.113	-.077
22. Psychological Minded	.236	.685	.132	-.344
23. Flexibility	.248	.110	.079	-.679
24. Femininity	-.135	.099	-.265	.112
25. Extro. Intro.	.765	.166	-.032	.040
26. Neurotic	-.436	-.464	-.120	-.070
27. CO Perceptual	-.034	.131	-.081	-.039

TABLE 14 (Cont.)

Variable	Factor V Non-Theo.-Social	Factor VI Feminine-Aesthetic	Factor VII Perceptual
1. Theoretical	.461	.257	-.086
2. Economic	.304	.209	.438
3. Aesthetic	.129	-.346	-.726
4. Social	-.905	-.015	.037
5. Political	.127	.086	.286
6. Religious	-.026	-.159	.083
7. Dominance	.053	-.055	.117
8. Capacity Status	.062	-.030	-.205
9. Sociability	.099	.031	-.027
10. Social Presence	.030	.190	-.180
11. Self Accept.	.032	-.133	-.012
12. Sense Well Being	.064	.164	-.078
13. Responsibility	-.166	-.330	.094
14. Socialization	-.111	-.033	.030
15. Self Control	-.006	-.002	.044
16. Tolerance	-.211	-.041	-.159
17. Good Impression	.094	.184	.081
18. Communality	-.123	-.116	.023
19. Achieve Conformity	.136	-.052	.091
20. Achieve Independence	-.175	-.258	-.263
21. Intellect. Efficiency	-.058	-.028	-.176
22. Psychological Minded	.183	-.145	-.088
23. Flexibility	-.340	-.102	-.239
24. Femininity	-.079	-.806	-.054
25. Extro.Intro.	-.176	-.265	.054
26. Neurotic	-.209	-.431	.137
27. CO Perceptual	.009	.219	-.801

labeled an extroversion-introversion factor. The CPI scales Dominance, Capacity for Status, Sociability, Social Presence, and Self-Acceptance, all loaded substantially on this factor. Gough (1957) provides descriptions of samples scoring high and low on his various scales. Decisions concerning these factors have been made on the basis of these descriptions rather than scale names when this information was available. Those who scored high on the above listed scales were described as outgoing, forceful, and talkative in comparison to the description of shy, retiring, and soft spoken for those who scored low on these scales. The substantial loading of the extroversion scale from the EPI also indicated that this was an extroversion-introversion factor.

Most of the variables which were highly loaded on Factor II also came from the CPI. Descriptions of high scorers on the variables of Sense of Well Being, Responsibility, Self-Control, Tolerance, Achievement via Conformity, Achievement via Independence, and Psychological Mindedness suggested that Factor II could be labeled an enterprising-becoming factor. That is to say, in the descriptions of high scorers, there was a theme of efficient, planful, capable industriousness in contrast to a theme of passive, inhibited, lazy behavior for low scorers. These themes explain well the negative loading of the neuroticism

scale, since the high scoring descriptions are the antithesis of the neurotic's hesitating attitude.

Factors such as Factor III essentially represented a compilation of the Allport-Vernon Scale which did not correlate highly with any other test. This factor was named the Economic, Political, Non-Religious factor after the three scales from the Allport-Vernon Test which loaded highly. The positive loading of the Economic and Political variables and the negative loading of the Religious variable is understandable since, according to Allport (1960), the economic attitude represents a concern for the useful and practical, the political attitude represents a concern for power on earth, while the religious attitude represents a concern with the ethereal and a withdrawal to a higher realm of existence.

Factor IV represented a further factoring of the Allport-Vernon Test with a high positive loading on the Theoretical scale and a high negative loading on the Social scale. This is consistent with Spranger's (1928) description of the antagonism between the Theoretic and Social attitude.

Factor V is constituted primarily of scales from the CPI, viz., Socialization, Responsibility, Communality, Achievement via Conformity, and Flexibility. The description of those scoring high on these scales is quite similar to that of those scoring high on the scales constituting Factor II. In addition to planfulness, thoroughness, and

industriousness, these people were described as having a sacrificial, dedicated, ascetic nature. In addition, individuals who scored low on the Flexibility scale were described as being mannerly and methodical. The substantial loading of the Economic scale from the Allport-Vernon Test fits this description since the Economic attitude emphasized practicality. Factor V was characterized as containing traits which describe the protestant ethic.

Factor VI represented the perceptual task. As was expected from the correlation matrix, few other variables are highly loaded on this factor.

Factor VII represented more factoring of the Allport-Vernon Scale since the Economic and Aesthetic scales loaded substantially. The positive loading of the Economic trait and the negative loading of the Aesthetic trait is understandable since the Economic attitude represented an emphasis on the practical and useful, and the Aesthetic attitude emphasized the beautiful but not necessarily the practical. Description of those scoring high on the femininity scale indicates that these people reject the opportunism associated with the Economic attitude.

Twenty-six of 27 traits were identical in all three analyses and the emergent factors were quite similar. The above descriptions, therefore, can be easily interpolated for Tables 13 and 14.

DISCUSSION

The results of this study supported Adler's social interest hypothesis, since this hypothesis predicted the obtained relationships of Age and Adjustment to selective attention behavior. However, two interactions, Age by Stimulus-type, and Diagnosis by Stimulus-type, indicated the role of the Stimulus is crucial in considering the above predictions. The factor analyses failed to clarify the two interactions, since neither the WF nor CO scores correlated substantially with the personality variables used in the factor analyses.

Two analyses of simple main effects demonstrated the efficacy of particular stimulus types in discriminating between different Age and Diagnostic samples. This finding suggests that a beginning point in research with double-aspect stimuli is the identification of possible significant similarities and differences among the perceptual stimuli. This would be in accord with the concern Gibson (1966) and Fisher (1968) have expressed regarding the specification of the psychophysical properties of stimuli used in perceptual research. The attempt to identify relevant stimulus properties can be made by: (a) noting past experimental findings and theoretical conclusions; (b) item analysis of stimuli in relation to criterion groups; and (c) factor analysis of the physical dimensions as well as Ss' responses to large groups of stimuli, i.e., development of

the psychophysics to be used. The present study employed the first two methods by testing Stone and Ansbacher's (1965) hypothesis and eliminating unsuccessful discriminators on the basis of pilot data.

Because of the significant interactions, it is necessary to discuss the effects of Diagnosis and Age in conjunction with the effects of Stimulus-type. The Diagnosis by Stimulus-type interaction effect was not as clear-cut as that obtained in the Age by Stimulus-type analysis. However, the probability of obtaining a Diagnosis by Stimulus-type interaction as large as that obtained ($.10 > p > .05$) brought the additivity assumptions for the tests of main effects under question (Winer, 1962). The tests of simple main effects supported this caution in assuming additivity, since these tests indicated that WF items failed to discriminate among diagnostic groups ($p > .05$), while CO items discriminated among diagnostic groups at the .01 level.

The significant simple main effect of Diagnosis with CO items and the post-mortem analysis of this simple main effect are in accord with predictions generated from the Adlerian social interest hypothesis. As expected, all hospitalized groups of Ss, regardless of diagnosis, gave significantly fewer H responses than the non-hospitalized adult sample. These differences are representative of the more child-like response style of the institutionalized Ss. The response pattern of the sociopathic sample was not as

child-like as the other patients and is reflected in the substantiation of the prediction that sociopaths would make more H responses than schizophrenics to CO items. The hypothesis that H responsiveness is related to extroversion-introversion was not supported, however, since the CO perceptual task did not load highly on the extroversion-introversion factor for the college student sample. The data obtained in this study require that all conclusions concerning the personality variables related to double-aspect perception must be held in abeyance, since no information related to double-aspect perception was yielded by the factor analyses. The implications of the factor analyses will be discussed in subsequent paragraphs. The difference between the schizophrenic and sociopathic samples may have reflected the severity of their disorders, as the sociopathic sample came from a less chronic ward of the hospital. Institutional effects, therefore, should be taken into account in future studies.

The more child-like nature of the perceptual style of institutionalized Ss is especially evident in the neurotic and schizophrenic groups, who gave fewer H responses to CO items than first graders. Of the non-hospitalized Ss, first graders gave the least H responses to CO items. The observation of a child-like perceptual pattern in institutionalized Ss is consistent with the findings of Werner (1948) and Huber and Stiggins (1970). However, the conclusion that the perceptual style of the mentally ill is child-like must

be qualified. On the one hand, hospitalized adult Ss gave fewer H responses than non-hospitalized adult Ss to CO stimuli, while on the other hand, children gave fewer H responses than adult Ss to WF and CO items. This difference between children and hospitalized Ss indicates that the child-like perception of the mentally ill is not invariant across types of stimuli.

The nature of the relationship between H responsiveness and Age was shown to be consonant with Adler's social interest hypothesis by the trend and post-mortem analyses. The linear component was the largest component of Age variability with both CO and WF items. Linearity, however, was more pronounced with WF items. Thus, responses to WF items better fit predictions from Adler's social interest hypothesis, since Adler posited what could be interpreted as a linear relationship between age and social interest. The post-mortem Fs with WF items also support this interpretation, since, with the exception of the change from the seventh to the ninth grade, there were significant grade by grade increases in H responsiveness from the first to eleventh grades. (The linear trend associated with WF items does not, however, necessitate the assumption that WF items reflect social interest.)

Moreover, the deviations from linearity with CO items may represent the sensitivity of these items to

adjustment difficulty. In other words, the dips in the overall linear trend may reflect situations that make adjustment more difficult. Several of the fifth and ninth grade Ss, for instance, expressed dissatisfaction with their school environment. Similarly, the decline of H responsiveness to CO items with the college sample may reflect the difficulty of adopting a new mode of living, since the college sample consisted largely of underclassmen.

The interactions of the Age by Stimulus-type and Diagnosis by Stimulus-type analyses indicate that WF and CO items are related to different constructs. The profiles of the two stimulus types across Age and Diagnostic groups should have been similar if they reflected the same construct. One interpretation would suggest that: (a) the perception of CO items is related to adjustment and thus social interest according to Adlerian theory; and (b) the perception of WF items is related to a global human orientation associated with Age. More specifically, it can be hypothesized that the positive relationship of H perception and Age with WF items reflects one's increasingly frequent social contacts as he grows older. It can be further hypothesized that the H responsiveness to WF items reflects the increasing amount of human figures in one's stimulus field and not the development of an empathic co-operative attitude. The assumption of this two-factor theory provides an adequate post-hoc explanation of the Age by Stimulus-type

and Diagnosis by Stimulus-type interactions. For example, if one makes the above two-factor assumption, only the CO items would be expected to differentiate between normal and hospitalized Ss of the same age. Conversely, WF and CO items would be expected to differentiate among Ss of different ages since general human orientation and social interest are hypothesized to be related to age. The above description also accounts for the observation that the Diagnosis by Stimulus-type analysis clearly supports the predictions generated from Stone and Ansbacher's (1965) hypothesis, i.e., that social interest is more related to perception of CO than WF items, while the Age by Stimulus-type analysis does not. According to the proposed two-factor theory, CO items would only be superior to WF items when age is held constant. (All Ss were in the same grade in Stone and Ansbacher's investigation.)

Interpretations based on such a two-factor theory could have been supported and clarified by the factor analyses of WF and CO perceptual scores, since different factor loadings for CO and WF items would have provided possible explanations for the two interactions. For example, partial support for the two-factor theory would have been obtained had CO items been more related to the neuroticism scale (general adjustment) of the EPI than WF items. While differences in this direction were obtained, the correlations between the perceptual task and any personality variables were too low to support any conclusions regarding these differences.

The preceding statements suggest the potential of factor analysis in double-aspect perceptual research. For this research, the possibility of a meaningful factor analysis may be enhanced by fulfilling the following conditions. First, the test battery should be reviewed to assess the relevance of the scales to the social interest hypothesis. The lack of an empathy scale may have been a serious shortcoming in the test battery for this project. Second, since the experimental phase demonstrated that double-aspect, human vs. non-human stimuli differentiated between Age and Diagnostic groups, the factor analytic Ss should be expanded to include Ss of diverse age and degree of adjustment in order to increase heterogeneity of response and to raise intercorrelations, since truncated ranges place a ceiling on correlations. Similarly, the number of perceptual items could be increased to eliminate the truncated nature of the perceptual score distribution. Increasing the number of perceptual items would also increase the likelihood of obtaining similar distributions for the perceptual and personality scores; thus the probability of obtaining substantial correlations would be raised. Care would have to be taken, however, to control for set with an increased number of stimuli. Third, the error variance (unreliability) of the perceptual task could be lowered. Observations made during experimentation indicated that systematic study of length of exposure and type of instruction would increase the discriminative power of this task, since some Ss saw both

aspects of the stimulus and were unsure whether to report first or subsequent impressions. Finally, as Holtzman (1968) indicates, the perceptual realm may represent a different aspect of one's existence than his verbal realm. Or, as Adler (1956) has stated, one's behavior and his explanation of his behavior may not be highly related. It may be necessary, therefore, to factor analyze different behaviors crucial to the social interest hypothesis in order to assess convergent validity.

If the above listed improvements are sufficient to allow the identification of variables related to double-aspect, human vs. non-human perception, a significant contribution can be made to developmental psychology, abnormal psychology, personality theory, and perceptual theory.

SUMMARY

Two analyses of variance and subsequent post-mortem analyses supported Adler's social interest hypothesis, since the hypothesis successfully predicted the positive relation of age to human orientation and the negative relation of maladjustment to human orientation in double-aspect selective attention behavior. However, two interactions, Age by Stimulus-type, and Diagnosis by Stimulus-type, indicated that the role of the stimulus is crucial in considering the above-stated relationships.

REFERENCES

Adler, A. Problems of neurosis. London: Kegan, 1929. (a)

Adler, A. The case of Miss R. New York: Greenberg, 1929. (b)

Adler, A. What life should mean to you. (1931) New York: Capricorn, 1958.

Adler, A. The individual psychology of Alfred Adler. Ansbacher, H. L., & Ansbacher, R. R. (Eds.), New York: Basic Books, 1956.

Adler, A. Superiority and social interest. Ansbacher, H. L., & Ansbacher, R. R. (Eds.), Evanston, Ill.: Northwestern Univ. Press, 1964.

Allport, G. W. Pattern and growth in personality. New York: Holt, 1961.

Allport, G. W., Vernon, P. E., & Lindzey, G. Manual study of values. (3rd ed.), Boston: Houghton, 1960.

Ames, L., Learned, J., Metraux, R., & Walter, R. Child Rorschach responses. New York: Hoeber, 1952.

Ames, L., Learned, J., Metraux, R., & Walter, R. Rorschach responses in old age. New York: Hoeber, 1954.

Ansbacher, H. L. The psychology of Alfred Adler. A series of lectures given at the University of Vermont from 9/63 to 1/64.

Ansbacher, H. L. The concept of social interest. Journal of Individual Psychology, 1968, 24, 131-139.

Ansbacher, H. L., & Ansbacher, R. R. (Eds.) The individual psychology of Alfred Adler. New York: Basic Books, 1956.

Ansbacher, H. L., & Ansbacher, R. R. (Eds.) Superiority and social interest. Evanston, Ill.: Northwestern Univ. Press, 1964.

Baldwin, I. T. The head-body ratio in human figure drawings of schizophrenic and normal adults. Journal of Projective Techniques, 1964, 28, 393-396.

Bernard, H. W. Human development in western culture. (2nd ed.) Boston: Allyn, 1967.

Brill, M. A study of instability using the Goodenough Drawing Scale. Journal of Abnormal and Social Psychology, 1937, 32, 288-302.

Bugelski, B. R., & Alampay, D. A. The role of frequency in developing perceptual sets. Canadian Journal of Psychology, 1961, 15, 205-211.

Childe, V. G. Man makes himself. (1936) New York: Mentor, 1951.

Coleman, J. C. Abnormal psychology and modern life. (3rd ed.) Chicago: Scott, 1964.

Crawford, M. P. The coöperative solving of problems by young chimpanzees. Comparative Psychology Monograph, 1937, 14, No. 68, Pp. 88.

Crawford, M. P. The cooperative solving by chimpanzees of problems requiring serial responses to color cues. Journal of Social Psychology, 1941, 13, 259-280.

Eysenck, H. J., & Eysenck, S. B. Manual for the Eysenck Personality Inventory. San Diego: Educational & Industrial Testing, 1963.

Fielder, F. E., & Siegal, S. M. The free drawing test as a predictor of non-improvement in psychotherapy. Journal of Clinical Psychology, 1949, 5, 386-389.

Fisher, G. H. Ambiguity of form: old and new. Perception and Psychophysics, 1968, 4, 189-192.

Freud, S. A general introduction to psychoanalysis. (1917) New York: Boni, 1920.

Freud, S. Papers on applied psychoanalysis. In E. Jones (Ed.), Collected papers. London: Hogarth, 1925, v. 4. (Republished as On creativity and unconscious. New York: Harper, 1958.)

Gibson, J. The senses considered as perceptual systems. Boston: Houghton, 1966.

Gough, H. Manual for the California Psychological Inventory. Palo Alto, Calif.: Consult. Psychologists Press, 1957.

Hall, C. A primer of Freudian psychology. New York: World, 1954.

Handler, L., & Reyher, J. The effects of stress on The Draw-A-Person Test. Journal of Consulting Psychology, 1964, 28, 259-264.

Hebb, D. O. A textbook of psychology. (2nd ed.) Philadelphia: Saunders, 1966, Pp. 247-248. (a)

Hebb, D. O. Animal altruism. (Filmed lecture) Ottawa, Canada: National Film Board of Canada, 1966. (b)

Hebb, D. O., & Thompson, W. R. The social significance of animal studies. In G. Lindzey (Ed.), Handbook of social psychology. Cambridge: Addison, 1954, Pp. 532-561.

Hiler, E. W., & Nesvig, D. An evaluation of criteria used by clinicians to infer pathology from figure drawings. Journal of Consulting Psychology, 1965, 29, 520-529.

Holzberg, J. D., & Wexler, M. The validity of human form drawings as a measure of personality deviation. Journal of Projective Techniques, 1950, 14, 343-361.

Holzberg, J., & Wexler, M. A further study of the validity of human form drawings in personality evaluation. Journal of Projective Techniques, 1952, 16, 249-251.

Holtzman, W. H. Holtzman Inkblot Technique. In A. I. Rabin (Ed.), Projective techniques in personality assessment. New York: Springer, 1968, Pp. 136-170.

Horney, K. Our inner conflicts. New York: Norton, 1945.

Huber, R. J., & Stiggins, R. J. Double-aspect perception and social interest. Perceptual and Motor Skills, 1970, 20, 387-392.

Jung, C. G. The basic writings of C. G. Jung. Laszlo, V. D. (Ed.), New York: Random, 1959.

Kellog, W. M. Porpoises and sonar. Chicago: Univ. Chicago Press, 1961.

Kelly, G. The psychology of personal constructs. New York: Norton, 1955.

Kohlberg, L. Development of moral character and moral ideology. In M. L. Hoffman, & L. W. Hoffman (Eds.), Review of child development research. New York: Russell Sage, 1964.

Kohlberg, L. Moral education in the schools: A developmental view. School Review, 1966, 74, 1-30.

Kohlberg, L. The child as a moral philosopher. Psychology Today, 1968, 2, No. 4, 24-30.

Koppitz, E. Emotional indicators on human figure drawings of children: A validation study. Journal of Clinical Psychology, 1966, 22, 313-315. (a)

Koppitz, E. Emotional indicators on human figure drawings of shy and aggressive children. Journal of Clinical Psychology, 1966, 22, 466-469. (b)

Leeper, R. W. A study of a neglected portion of the field of learning: the development of sensory organization. Journal of Genetic Psychology, 1935, 46, 41-75.

Lerner, E. The problem of perspective in moral reasoning. American Journal of Sociology, 1937, 43, 249-264.

Machover, K. Personality projection in the drawing of the human figure. Springfield, Ill.: Thomas, 1949.

Margolis, M. A comparative study of figure drawings at three points in therapy. Rorschach Research Exchange, 1948, 12, 94-105.

Masserman, J. H., Wechkin, S. & Terris, W. Altruistic behavior in rhesus monkeys. American Journal of Psychiatry, 1964, 121, 584-585.

May, R. The emergence of existential psychology. In R. May (Ed.), Existential psychology. New York: Random, 1961, Pp. 11-51.

May, R. The emergence of existential psychology. In R. May (Ed.), Existential psychology. (2nd ed.) New York: Random, 1969, Pp. 11-51.

Moreno, J. L. Who shall survive. Washington: Nervous and Mental Disease Publishing Co., 1934.

Murray, H. A., & Kluckhohn, C. An outline of a conception of personality. In Kluckhohn, C. & Murray, H. A. (Eds.), Personality in nature society and culture. New York: Knopf, 1948.

Piaget, J. Children's ideas. In C. Murchison (Ed.), Children's philosophies. Worcester: Clark Univ. Press, 1931, Pp. 377-391.

Piaget, J. The moral judgment of the child. New York: Harcourt, 1932. (a)

Piaget, J. The language and thought of the child. (2nd ed.) New York: Harcourt, 1932. (b)

Piotrowski, Z. Perceptanalysis. New York: Macmillan, 1957.

Richey, M. H., & Spotts, J. V. The relationship of popularity to performance on the Goodenough-draw-a-man test. Journal of Consulting Psychology, 1959, 23, 147-150.

Rubin, E. Synsoplevede figurer. Copenhagen: Glydenalski, 1915.

Siebenaler, J. B., & Caldwell, D. K. Co-operation among adult dolphins. Journal of Mammalogy, 1956, 37, 122-128.

Spranger, E. Types of Men. (5th ed.) Halle, Germany: Verlag, 1928.

Stone, P. A., & Ansbacher, H. L. Social interest & performance on the Goodenough-Harris-draw-a-man test. Journal of Individual Psychology, 1965, 21, 178-186.

Strumpfer, D. J., & Huysamen, G. K. Correlates of the communication organ score on The Harris-Goodenough drawing test. Journal of Individual Psychology, 1968, 24, 60-62.

Sullivan, H. S. The interpersonal theory of psychiatry. New York: Norton, 1953.

Thorpe, J. S., & Swartz, J. D. A developmental analysis by means of the Holtzman Inkblot Technique. Journal of Projective Techniques and Personality Assessment, 1966, 30, 447-451.

van Kaam, A. Existential foundations of psychology. Pittsburgh, Pa.: Duquesne Univ. Press, 1966.

Vane, J., & Eisen, V. The Goodenough Draw-A-Man Test and signs of maladjustment in kindergarten children. Journal of Clinical Psychology, 1962, 18, 276-279.

Wallach, H., & Austin, P. A. Recognition and the localization of visual traces. American Journal of Psychology, 1954, 67, 338-340.

Werner, H. Comparative psychology of mental development. (2nd ed.) New York: Int. Univ. Press, 1948.

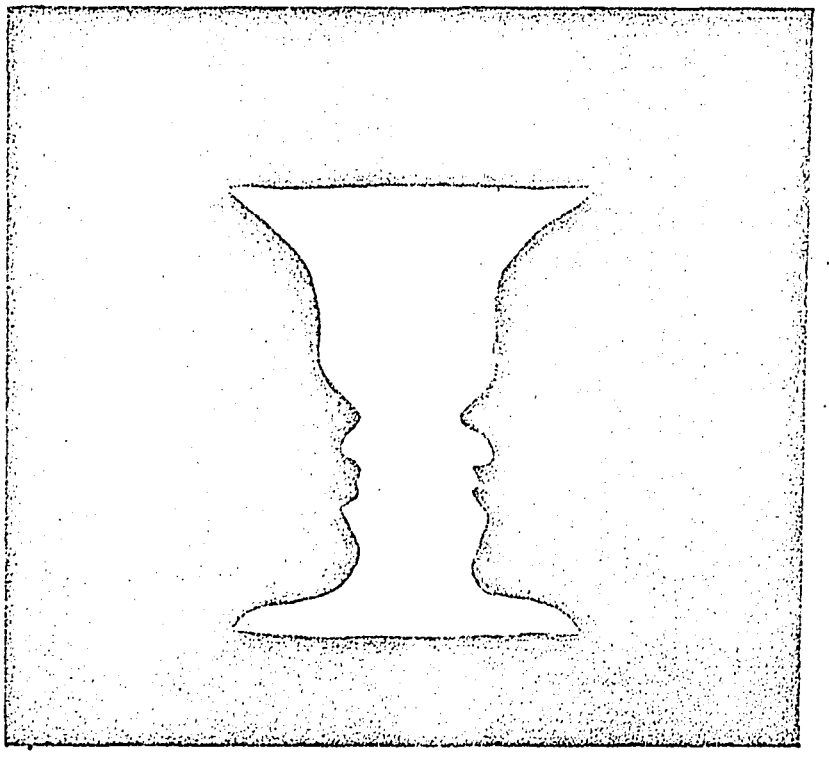
Winer, B. J. Statistical principles in experimental design. New York: McGraw, 1962.

APPENDIX

STIMULUS MATERIAL

STIMULUS 1

VASE-FACE (WF)



STIMULUS 2

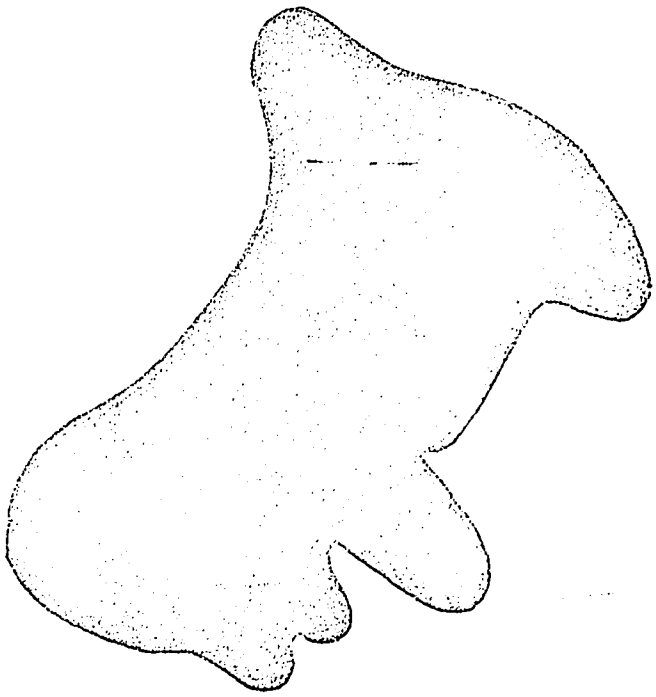
CLIFF-FACE (WF)

STIMULUS 3

RAT-MAN (WF)

STIMULUS 4

DOG-CHEF (WF)

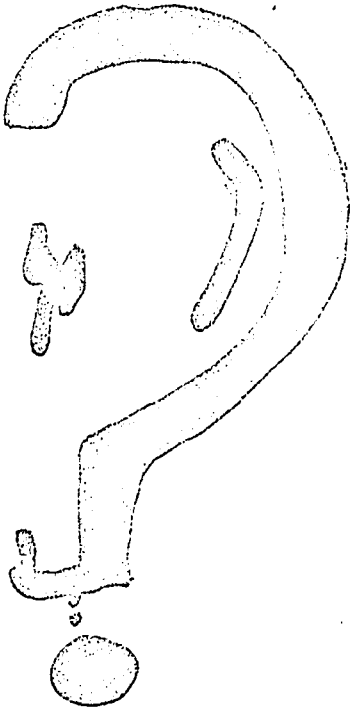


STIMULUS 5

RABBIT-PIRATE (WF)

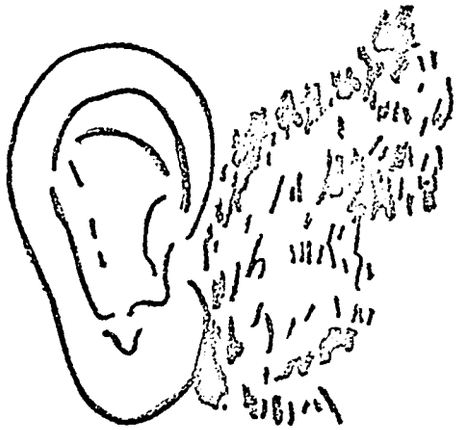
STIMULUS 6

QUESTION-EAR (CO)



STIMULUS 7

SQUIRRAL-EAR (CO)



STIMULUS 8

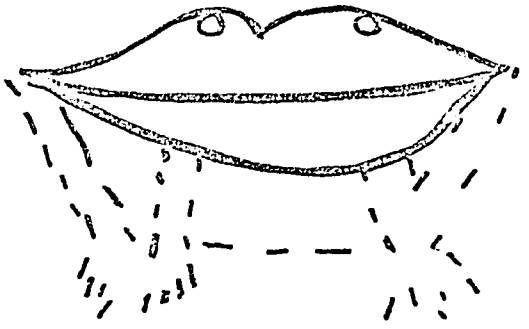
CLIFF-NOSE (CC)

STIMULUS 9

MOUNTAIN-MOUTH (CO)

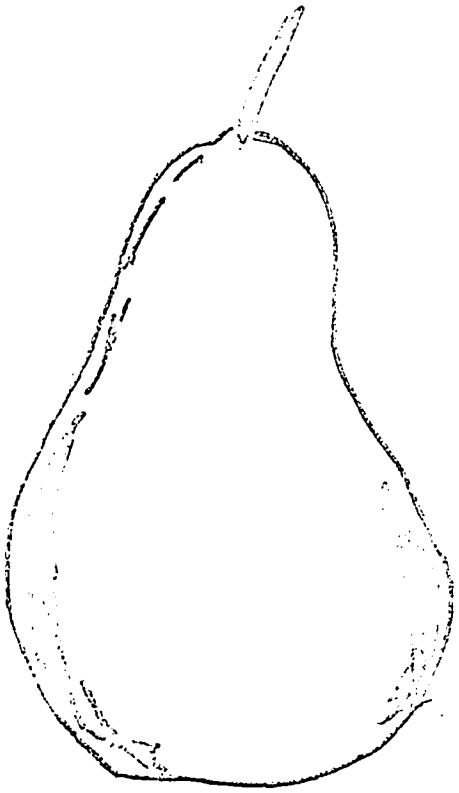
STIMULUS 10 :

FROG-MOUTH (CO)



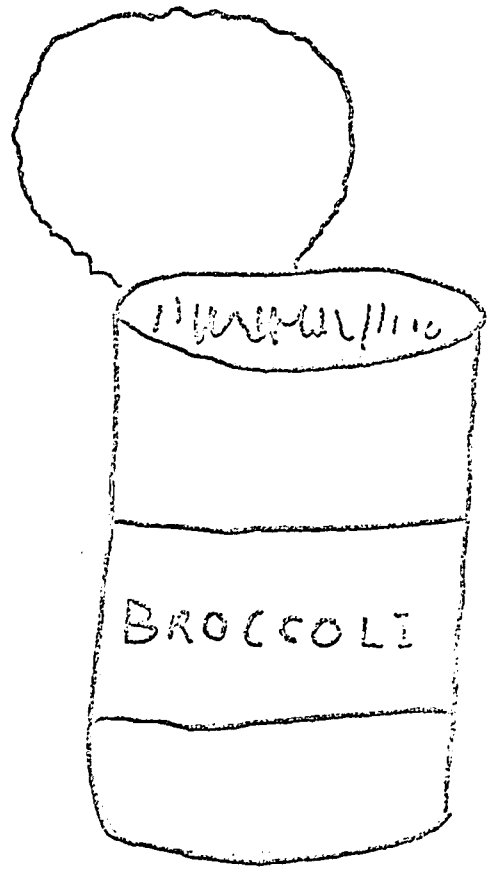
STIMULUS 11

BUFFER PEAR



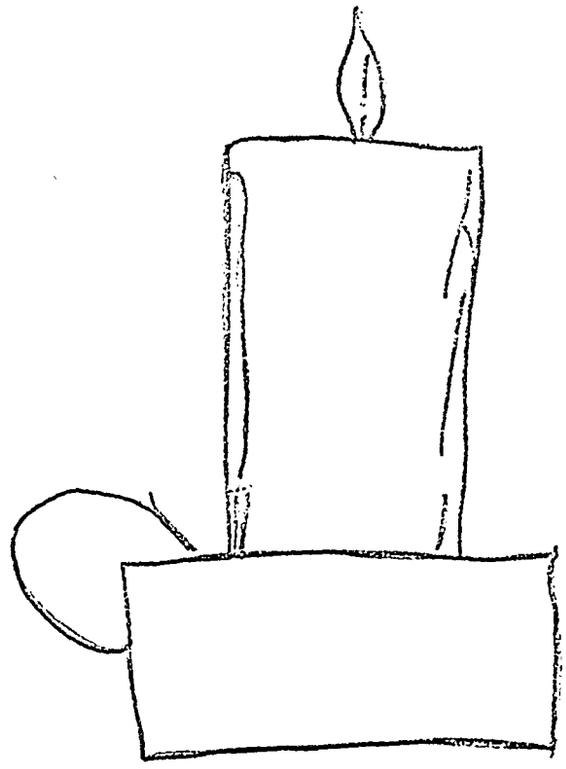
STIMULUS 12

BUFFER CAN



STIMULUS 13

BUFFER CANDLE



STIMULUS 14

START PENCIL