AFFECTIVE ENCODING/DECODING AND PERSON PERCEPTION

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PREFACE

This study took a first look at the relationship between affective facial encoding/decoding of emotion and person perception, along with two personality correlates of these constructs. Both these areas of research have traditionally been difficult to quantify and analyze; consequently there is not a solid base of research upon which to build. It has been gratifying to see meaningful results in this study, especially since the extent and complexity of these two areas have at times appeared overwhelming.

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CHAPTER I

REVIEW OF THE LITERATURE

Introduction

Within the field of psychology much emphasis is placed upon defining and categorizing mental illness. This is evident in the flood of abnormal psychology textbooks now available and in the present controversy surrounding the recategorization of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (Goleman, 1978). Unfortunately, not nearly as much literature specifying what constitutes mental health is available. Simply because an individual does not display obvious symptoms of mental illness does not necessarily imply that one is mentally healthy. There are far more definitions and descriptions of psychopathology than of mental health. For example, few manuals for psychological tests describe healthy responses in nearly as much detail as unhealthy responses.

Several authors have attempted to define or establish the criteria for positive mental health. Jahoda (1958) analyzed many definitions and compiled a set of criteria. Among her criteria, Jahoda listed

> . . . attitudes toward the self; they include the accessibility of the self to consciousness; the correctness of the self-concept; its relation to the sense of identity and the acceptance by the individual of his own self. Perception of reality; a relative freedom from need-distortion and the existence of empathy (p. 14).

Paraphrasing Jahoda, health implies that one can accurately perceive

oneself and others. Rogers (1951) emphasized the capacity for awareness and openness to experience as criteria. Both of these concepts are based on accurate perception of the self and others. Gordon Allport (1961) emphasized realistic perception as a salient quality of the "mature personality." Korchin (1976) listed a strong sense of personal identity, realistic selfesteem, detachment, and sensitivity to the self and others as basic elements in a healthy mature personality.

Beck (1976) described man as having the key to understanding and solving his psychological disturbance within the scope of his own awareness. Beck conceptualized man as a scientist, capable of functioning well within the complexities and pressures despite conflicts and demands made upon him. Continuing the analogy, Beck described psychological problems as thoughts and actions based on faulty learning, incorrect information, or on an inability to differentiate imagination from reality. These problems can be mastered by the individual only when one sharpens discriminations, corrects misperceptions, and learns more adaptive attitudes. Beck labeled his approach to dealing with pathology as cognitive theraphy. Beck's concepts seem to focus on perception of reality, most notably the accurate perception of the self and others as a prerequisite to adequate functioning in interpersonal relationships.

One could argue that positive mental health is dependent on accurate perception. An individual could not function well, if at all, without an accurate awareness of reality. Man has progressed from the nearly solitary hunter-and-gatherer lifestyle to a totally interdependent lifestyle where contact with others in both survival and leisure activities is nearly continuous. In that process where one seems to be constantly rubbing shoulders with another, man has shifted from a primary need to

perceive environmental reality to a need to perceive accurately interpersonal reality. Since person perception is so necessary to function adequately, it is well to define further and specify its elements.

Problems in Defining and Measuring Person Perception

Cronbach (1955) reviewed "social perception" research and demonstrated that prior research in this area was confounded by mathematical dependencies. Cronbach asserted that simple, operationally defined measures of perception contained mathematical artifacts that could conceal important variables or depend heavily on unwanted components. As such, then-current analyses were confounded and uninterpretable. While Cronbach was highly critical of perception research from a mathematical viewpoint, Cline (1964) reviewed other complications of a more theoretical nature, e.g., the accuracy of one type of perception may be dependent upon another perception. That is, measures of subtypes of perception may be conceptually dependent even if mathematically independent. Cline also discussed variance within predictions as it relates to measuring perception.

Among the perception variables that have received the most attention in the literature are variants of Accuracy and Empathy, although definitions of these concepts are not always consistent and consequently result in much confusion. These most basic perceptions are here defined as: (a) Accuracy: the degree of one's ability to predict how another individual views oneself; (b) Stereotypic Accuracy: the degree of one's ability to predict the average of how two or more others view oneself; (c) Empathy: the degree of one's ability to predict another's view of him or herself; and (d) Stereotypic Empathy: the degree of one's ability to

predict the average of two or more others' self views. Another important aspect of person perception is the variance of predictions. As Cronbach (1955) demonstrated, strong differentiation (i.e., making strong statements) tends to result in far more serious absolute errors than moderate differentiations. That is, one's accuracy of predictions is enhanced if that individual makes and uses fine rather than gross discriminations in rating the self or others. As such, it is important to include the variance of ratings and predictions of ratings when considering person perception.

In general, person perception is an important topic because of its relevance to mental health and psychotherapy. While there are inconsistencies and difficulties in the perception literature, several definable concepts are of theoretical as well as practical interest and merit further study.

Person Perception

For the purposes of this study, person perception can be divided into two major types. The first major type, Perception, is composed of two subtypes. Self Perception and Other Perception are truly perceptions since they have referents in the "real world." The second major type of perception is best labeled as Meta-Perception, since it is actually a perception of a perception. This can also be divided into two subtypes, Self Meta-Perception and Other Meta-Perception. The first involves one's perception of another's perception of oneself and the second involves one's perception of another's self perception (i.e., perception of another's Other Perception and Self Perception, respectively). Table I demonstrates these relationships. These terms can be

restated more concretely as: (a) Self Perception: how I see myself; (b) Other Perception: how I see you; (c) Self Meta-Perception: how I see you seeing me; and (d) Other Meta-Perception: how I see you seeing yourself. These four elements of person perception are the primary focus of this study, since they are the most basic premises on which one bases his or her human interactions. The accuracy of those basic perceptions and meta-perceptions determine an individual's ability to deal effectively on an interpersonal basis, as misperceptions would hinder meaningful and productive interchange on a daily basis by precluding intimacy, understanding, and trust in a relationship where one could not predict to a fair degree how another views oneself or himself.

TABLE I

PERSON PERCEPTION TERMS

	Perception	Meta-Perception
Self	One's perception of oneself	One's perception of another's perception of oneself
Other	One's perception of another	One's perception of another's perception of himself or herself

Self Perception

Bernard Chodarkoff (1954) investigated the field of self perception with special reference to adjustment and defensiveness. In this complex

study 30 (presumably normal) male college students took the Rorschach test, the Thematic Apperception Test, and a word association test; they also filled out a biographical inventory and described their self-concepts using a Q-sort. Subjects' defensiveness was measured with a specially devised perceptual-defense test. Judges that were clinical psychologists has access to all the subjects' data except their Q-sorts. Judges then constructed a Q-sort for each subject and indicated the adequacy of subjects' adjustment. The subjects' Q-sorts were then correlated with the judges' Q-sorts of the subjects. Results indicated that subjects whose self-descriptions agreed closely with the judges' descriptions of them were rated as better adjusted than subjects who agreed less closely with the judges. Subjects that agreed with the judges were also less defensive. Thus, seeing oneself similarly to a psychologist's view of oneself correlates positively with more effective adjustment and less defensiveness. An alternative explanation is that seeing oneself as "normal" or "average" might result in a spuriously high degree of agreement between Self ratings and judges' Other ratings.

Janis (1955) looked at the effect of another's perception of a person on that person's self-perception. Janis found that subjects' self-perceptions were markedly influenced by others' perceptions of them. The obverse does not seem to be true, however. Subjects' self-perception did not seem to influence others' perceptions of them. This seems to imply that in a social situation an Asch-like effect occurs (Asch, 1951). Individuals tend to alter self-perception to reflect, or be congruent with, others' perceptions of them rather than others altering their perceptions to concur with an individual's self-perception.

Hass and Maehr (1965) also looked at the effect of others' perceptions on self-perception. Subjects' self-conceptions were experimentally

altered as a result of exposure to another's discrepant reaction. The dramatic effect persisted and was measured on a six-week follow-up after a single exposure. Even more dramatic and persistent effects occurred after two such exposures. These authors, like Janis (1955) clearly point to the importance of others' perceptions and the tendency to change the self-perception to be congruent with others' perceptions, especially consistent perceptions.

Gerzen and Wishov (1965) conducted a study that showed the importance of others' self-perceptions on one's own self-perception. Subjects were told they would interact with another person that was either a self-enhancing, average self-evaluative, or self-derogatory person. Subjects emphasized aspects of themselves on a self-rating measure that were congruent with the "others'" hypothetical self-perception. Self-perception is somewhat a function of others' self-perception in that individuals tended to rate themselves as they perceived others rating themselves.

In sum, studies indicate that Self Perception can be influenced by several interpersonal factors. Among those factors that can be influential are another's Self Perception and another's Other Perception of oneself (i.e., another's view of us).

Other Perception

Perceiver Variables. The second type of person perception is the perception of others, Other Perception. The perception of another by an individual can be a function of a variety of factors.

Crockett and Merdinger (1956) found that some subjects tend to rate their peers as similar to themselves. High authoritarian subjects tended to rate their peers as high authoritarian regardless of their peers' actual authoritarianism. Low authoritarian subjects were variable, but

tended to rate their peers as high or moderate in authoritarianism. Generally, subjects in this study perceived their peers more on the basis of their own idiosyncrasies rather than on the basis of reality. Jones (1955) also found that authoritarian subjects were less sensitive to psychological and personality characteristics and were less accurate on personality perception measures than were non-authoritarian subjects. He also found that authoritarian subjects rated leaders more positively than did non-authoritarian subjects. Apparently, some inaccuracies in Other Perception were a result of role sterotyping or halo effects. High authoritarian subjects erred by mistakenly rating others on similar to themselves.

Dittes (1959) also found that the perceiver variable of self-esteem is a factor in the perception of others. Subjects were exposed to either a warm, accepting group or a cool, poorly accepting group. Not surprisingly subjects perceived the warm, accepting group as more attractive than the other group. This was especially true for low self-esteem subjects. The interaction of self-esteem and acceptance or warmth greatly affected the perception of others by the subjects.

It is apparent from these studies that several perceiver variables can affect Other Perception. Among these are the Perceiver's authoritarianism and self-esteem. Presumably, extremely positive or negative perceiver variables will have a profound effect on the accuracy of person perception.

Variables Within the Perceived Other. Other Perception can also be influenced by personality factors of the perceived individual, as one might logically assume. In terms of the personality factor of conformity, Streufert (1965), in a study of conformity versus deviance and its relationship to interpersonal distance, found that subjects' attitudes toward

conforming group members became more favorable as interpersonal distance (in terms of spatial distance and temporal duration of interaction) decreased. Additionally, subjects' attitudes toward a deviant member became more unfavorable as interpersonal distance decreased. Interpersonal distance was shown to be a factor in the perception of others, since subjects rated deviants more negatively and conforming members more positively as members became closer.

Goodchilds (1959) looked at types of wit as a factor in Other Perception. Subjects rated fictional characters in terms of perceived popularity and power after reading fictional conversations. The results showed that the type of wit the individual displays was a factor in how that individual was rated.

Jones, Hester, Farina, and Davis (1959) looked at the factor of adjustment in the perceived person. The study involved pairs of subjects and pairs of confederates. One confederate made derogatory comments about one of the subjects while the other confederate was non-committal and mildly sympathetic. In one condition the derogator was identified as maladjusted while the non-committal confederate was identified as well-adjusted. In another condition the identifications were reversed. Results indicated that the targets of the derogation perceived the maladjusted derogator to be more likeable than the well-adjusted derogator. However, the well-adjusted derogator was rated as more credible. The bystander subject rated the maladjusted derogator as less likeable than did the target of the derogation. This shows that the label of adjustment or maladjustment affects the perception of that person by an individual. When subjects (targets) were aware of the label, they discounted the derogation from the maladjusted confederate and found him (her) more likeable than the credible, well-adjusted derogator and more likeable

than bystanders, who were unaware of the labels, found either derogator.

Relationship Factors Affecting Other Perception. The Jones et al. (1959) study also points to differences in Other Perception that are a function of the type of relationship that exists between two individuals. Walster, Walster, Abrahams, and Brown (1966) looked at the effects of the respect one person has for another on Other Perception. Specifically, this study looked at the effect of erroneously given respect or disrespect on subsequent perceptions of respectability. Some subjects discovered that they had accorded relatively more or less respect than the other person deserved. Each condition produced a temporary overcompensation for the earlier error on the subsequent perception of the other person's respectability. Thus, it seems apparent that perception of another can be affected not only by misperception, but overcompensation following an earlier misperception.

Another relationship factor affecting Other Perception is compatability. Spolsky (1969) examined compatability between a doctor and a patient using the Fundamental Interpersonal Relations Orientation-Behavior. The results of this study indicated that compatability had an effect on the way the patient perceived the doctor, which, it turn, had implication for treatment outcome effects.

Several corollary studies point to another factor influencing Other Perception. Podell and Amster (1966) found that the more positive (or negative) information a subject had about another, the more his perception of that other is polarized on a good-bad dimension. Himmelfarb (1972) looked at both the amount and the source of information about the other person. Two factors of the source of information seem important. For a given amount of information, the more sources that information was

compiled from, the greater its effect on Other Perception. Secondly, the more diverse the situations in which a source had observed another, the greater the effect the information had on Other Perception. Taken together, these two studies indicate that the volume of information, the diversity of sources, and diversity of the sources' information each influences how much a given amount of information will affect Other Perception.

Meta-Perception

Self Meta-Perception

The first type of Meta-Perception to be considered is one's perception of how a second person perceives oneself. For purposes of this study, the term Self Meta-Perception will be used.

Several studies have shown Self Meta-Perception to be quite important in social interaction. Goslin (1962) indicated that adolescent boys and girls who were unable to predict accurately how their peers perceived them tended to be isolated from their peers. The question is somewhat open concerning causation. In essence, did the social isolation reduce potential information upon which to make accurate self-other perception predictions; did the inaccurate Self Meta-Perception produce social isolation; is there a vicious circle effect; or were both caused by one or more other unidentified factors? Kleinfield (1972) showed that Self Meta-Perception is important not only in the level of interpersonal interaction, but also that it is related to one's self-concept. Kleinfield looked at black and white school children's academic self-concepts in relation to their parents' and teachers' Other Perceptions of the children's academic selves. Results indicated that white children's self-concepts were more

strongly related to their prediction of their parents' Other Perception than to their prediction of their teachers' Other Perception of them. An opposite trend occurred for blacks and was significant for females. Black children's self-concepts, especially black females' self-concepts, were more strongly related to teachers' than to parents' Other Perceptions of them.

Broxton (1963) also pointed to the importance of Self Meta-Perception, Broxton looked at the level of interpersonal attraction in college roommates. Results clearly indicated that interpersonal attraction in a dyad is more closely related to one's Self Meta-Perception than to how one's partner actually perceives oneself. Broxton's study, like Bandler and Grinder's (1975) assertions, points toward the greater importance of the perception of reality than of reality itself.

Backman and Secord (1962) found that among intact living groups the liked persons (to a significantly greater extent than disliked persons) were seen by others in the group as having an Other Perception that was congruent with one's own Self Perception. If an individual liked another person, that person was seen as attributing to the individual the same traits that he/she attributed to himself/herself. In a similar study Deutsch and Solomon (1959) found that if one's Self Perception is perceived to be similar to another's perception of oneself, one tends to like that person more. Additionally, these investigators found that when one's Self Perception is seen as confirmed by another, one tends to think better of himself or herself. Sigall and Landy (1973) looked at the effect of the attributes of one's associates on his predicted Self Meta-Perception. College males predicted others' ratings of them as favorable when they were paired with an attractive female associate, intermediately when they were not paired with a female associate, and most unfavorably when they

were paired with an unattractive female associate. Thus, it seems that one's Self Meta-Perceptions are based in part on characteristics of one's associates. Presumably, some characteristics within the other person can affect one's Self Meta-Perception.

Other Meta-Perception

The second type of Meta-Perception is one's perception of another person's self perception, here defined as Other Meta-Perception. One example of this type of person perception is a study by Gray and Gaier (1974). They examined parents' and friends' perceptions of female high school seniors' self perceptions. Single friends were found to have the greatest accuracy in their Other Meta-Perceptions, but friends in general were more variable in their degree of accuracy than parents were. Both parents and friends had fairly accurate Other Meta-Perceptions, but best friends were more accurate while parents were more consistently accurate.

Person Perception and Emotional Adjustment

While the cited literature does point out some determinants of person perception and a few studies show that it can be experimentally manipulated, readily available studies do not establish an unequivocal relationship between accurate person perception and positive emotional adjustment or mental health. The Chodarkoff (1954) study does point out such a relationship, but is open to interpretation because of its general nature. The Janis (1955), Hass and Maehr (1965), and Gerzen and Wishov (1965) studies showed that the accuracy of Self Perception can be reduced experimentally and one might conclude that reduced accuracy is apt to interfere with one's adjustment, but this is hardly a convincing argument in support of the relationship of person perception and mental health.

Person Perception in Four-Person Groups

Fromme (Reference Note 1) has developed a paper-and-pencil instrument, the Group Perceptions Test (GPT) that overcomes many of the difficulties discussed by Cronbach (1955) and Cline (1964). The GPT (Appendix A) permits one to quantify simultaneously the perceptions of each person in a four-person group. Using a Likert-type format, individuals rate themselves and the other group members on a series of 10 adjectives in terms of Self Perception, Other Perception, Self Meta-Perception, and Other Meta-Perception. These four types of raw scores are correlated and transformed into $\underline{z}$ scores in such a way to yield scores on a series of 15 scales of person perception. Several of these scales parallel perception concepts found in the literature (Cronbach, 1955; Tagiuri, 1969; and Lorbre, 1973) and other scales show promise as useful concepts. Marcy has demonstrated in a preliminary study that the GPT is a valid instrument that can detect several types of meaningful perception.

The 15 scales that are contained in the GPT consist of Meta-Perceptions and combinations of Self Perception, Other Perception, Self Meta-perception and Other Meta-Perception. These scales and their meanings are listed below. The Group Perception Test is presented in Appendix A.

1. Accuracy: degree to which one can predict how others perceive oneself (Self Meta-Perception).

2. Stereotypic Accuracy: degree to which one can predict how the "average other" perceives oneself (average Self Meta-Perception).

3. Empathy: degree to which one can predict how others perceive themselves (Other Meta-Perception).

4. Stereotypic Empathy: degree to which one can predict how the "average others" perceive themselves (average Other Meta-Perception).

5. Interpersonal Openness: degree to which others can predict one's rating of them (reflects feedback).

6. Personal Openness: degree to which others can predict one's self rating (reflects self-disclosure).

7. Felt Openness: degree to which one predicts that others agree with one's self rating (reflects feeling understood).

8. Perceived Realism: degree to which others predict that one rates oneself as they would rate one (reflects that others see self-understanding in one).

9. Perceived Similarity: degree to which one rates oneself as similar to others.

10. Commonality: degree to which others rate themselves as similar to one (reciprocal perceived similarity).

11. Other Acceptance: degree to which one rates others as they rate themselves (reflects accurate perception and acceptance of other's self presentation).

12. Concurrence: degree to which one rates others as they are perceived rating themselves (reflects acceptance of other's self presentation).

13. Perceived Concurrence: degree to which others predict that one rates them as they rate themselves (reflects other's perception that their self presentation is accepted by one).

14. Conformity: degree to which one's judgement of others conforms to the group's judgement of those others.

15. Congruence: degree to which one rates others as they are perceived rating oneself.

Fajen (Reference Note 2) used Fromme's Group Perceptions Test in a recently completed study. Data from his analyses clearly validated several scales by demonstrating statistical independence and predictive elements of Accuracy (Self Meta-Perception) and Empathy (Other Meta-Perception). Additionally, this study demonstrated wide individual differences in various measures of perception and that perception was somewhat a function of the experimental style of group interaction. For example, four-person groups that were reinforced for exchanging historical information actually decreased in several measures of perception across three

sessions. Groups that were reinforced for emotional expression or empathy showed differential increases in accuracy scores.

In addition to demonstrating measurable changes in several types of person perception, Fajen demonstrated a positive relationship between person perception as measured by the GPT and mental health as measured by Jourard's Self-Disclosure Questionnaire (Jourard, 1971), Shostrum's Personal Orientation Inventory (Shostrum, 1963, 1964), and Watson and Friend's (1969) Social Avoidance and Distress Scale. Person perception is a broad area that encompasses many components or subheadings. In general, person perception can be conceptualized as being based on two types of information or interaction, including verbal and nonverbal cues. For example, verbal cues that influence person perception include voice tone, speed of verbalization, dialect or accent, complexity and competency of vocabulary and grammar, and accuracy of articulation of vocal sounds. On the other hand, nonverbal cues that influence person perception include a wide variety of phenomena including, for example, size of the person, style of dress, attractiveness, facial expression, gestures, eye contact, and distance maintained between individuals.

Emotion

One of the important areas within verbal and nonverbal communication is the communication of emotions. In spite of the fact that the field of emotions is a central theme within psychology, there is not a great deal of agreement within psychology itself and among psychology and other closely related sciences as to what emotions are or whether they are a valid topic for study. On one hand, some scientists (Duffy, 1962) have held that the study of emotions is unnecessary in the study of behavior.

Others see emotions as a function of visceral functions or activities of organs innervated by the autonomic nervous system. Still others have emphasized emotions as experiences that are under voluntary control (Gellhorn, 1964, 1970; Tomkins, 1962, 1963; Ekman, Friesen, and Ellsworth, 1972; Izard, 1971, 1972). Others see emotions as primary motivational systems (Izard, 1977). On the other hand, many psychologists consider emotions as the source or byproduct of psychopathology and therefore one of the primary focal points in the study or understanding of human behavior as well as alleviating pathology and suffering.

Because of the wide variety of theoretical and philosophical approaches to the topic of emotions and the contradiction of research regarding emotions, there is a need to explore further and define the area. One might profitably ask about individuals' ability to recognize, experience, and communicate emotions as well as asking about personality characteristics that are related to these abilities. It seems that despite the fact that although everyone experiences a variety of types and intensities of emotions, this is probably one of the most poorly defined and researched topics within psychology. Quite possibly this deficit is due to the lack of adequate data that is due, in turn, to a lack of adequate tools to gather artifact-free data. The very subjective nature of the experience of emotions makes this topic one of the most difficult to specify, quantify, and analyze in an ostensibly scientific manner. Perhaps a more thorough presentation of what emotions are, how they are communicated, and what personality characteristics correlate with specific emotional experiences would help to form a more comprehensive base upon which to build a theory of human behavior and to develop effective methods to change behavior, attitudes, and feelings.

Present-day studies of emotion generally refer to Darwin's (1872) work as the starting point of scientific efforts directed at determining the sources and effects of human emotions. Other important theorists who have made far-reaching contributions in the field of emotions include James (1884, 1890), who described feelings as interpretations of feedback from changes in the various body systems within specific situations. Another important contributor, Lange (1885), defined emotions as vasomotor disturbances or excitement in the visceral and glandular organs. The ideas of these pioneers were combined and became known as the James-Lange theory, an approach that was accepted for a relatively long period of time. Cannon (1927), using experimental laboratory animals, disconfirmed the James-Lange feedback theory by demonstrating that emotional behavior could be separated from the visceral organ systems. Cannon did not approach the question of whether emotional behavior could be learned as a function of the visceral organ systems and then exist independent of that system, however. Allport (1924) looked beyond the autonomic nervous system and visceral processes to the somatic system and striate muscle feedback as determinants in the experience of emotion. Within the striate muscle system, a focal point of interest and research has been the role of facial expression and proprioception of facial expression of emotional behavior.

Despite the innate or universal qualities of emotion that are presumably of genetic origin, there are individual differences in the experience and effects of emotionality (Izard, 1977). Early differences in both the experience and expression of emotion could conceivably have dramatic long-term effects in terms of one's own attitudes as well as others' reactions to one's pattern of emotional expression.

In reviewing individual differences in emotionality, Izard (1977) noted the contemporary views of distinctly different views of consciousness

or modes of knowing about one's self and environment. Izard traced the development of hemispheric differences in cognition and emotion from ancient Eastern thought through 13th century Roger Bacon's discussion of knowledge and Spencer's late 19th century writings to the more contemporary efforts of writers such as Gazzaniga (1967) and Ornstein (1973). This hemispheric difference of logical and rational versus intuitive attitudes or states of consciousness may have a tremendous impact on one's emotional or personality development. One may be predisposed to be analytical, critical, and logical as opposed to maintaining a more nonspecific interest or receptivity of information relative to others or to one's environment in general.

Whether one considers the experience and expression of emotion to be genetic or innate, to be learned, or to be some combination of these sources, the long-term effects of emotionability on personality and behavior are tremendous when one considers the effects of the reaction of others in terms of positive or negative feedback loops.

Basing their work on Spencer's (1890) and Wundt's (1896) conceptions of the dimensions of emotions, Woodworth (1938) and Schlosberg (1941) made significant contributions to the field of emotions. Woodworth proposed a system of facial expression of discrete emotions. Schlosberg, utilizing judgements of photographed expressions, modified Woodworth's linear scale of emotional expression and described a circular model with two dimensions: pleasantness-unpleasantness and attention-rejection. Engen, Levy, and Schlosberg (1958) added a third dimension of sleep-tension. Other theorists have continued in the dimensional approach to emotional expression, generally utilizing a recognition of facial expression paradigm as a research medium.

The categorization of dimensions of emotions formed the basis for several theories of personality. Plutchik (1962) developed a model of eight primary emotions that had implications for both the study of personality and psychotherapy.

Plutchik (1980) defined an emotion as a process or sequence of events having elements of cognitive appraisal, feeling, impulses, and overt behavior. These behavioral sequences involved to enable the organism to function more effectively in its environment. Plutchik arranged eight primary emotions in a circle or wheel configuration and added the third dimension of intensity. Based on the eight primary emotions, Plutchik conceptualized additional emotions as combinations of adjacent emotions (primary dyads) or non-adjacent emotions (secondary or tertiary dyads) much like combining primary colors to create various blends and shades of color. Plutchik found that specific identified groups were characterized by fairly stable emotional dispositions and demonstrated relationships between character disorder diagnoses and emotional traits, apparently independent of overt behavior. Plutchik also described the possible development of characteristic ego defense mechanisms to cope with specific emotions. Plutchik's attempted integration of emotions, traits, diagnoses, and ego defenses appears to be a meaningful contribution to the literature of emotions, despite his own recognition that his own concepts are neither conclusive nor exhaustive.

The Circular Theory of Emotions

Fromme (1977) proposed a model of eight emotions arranged in a wheel configuration somewhat similarly to Plutchik (1962, 1980), but went beyond simple categorization and configuration of the emotions. Fromme (1977)

defined the eight primary emotions of elation, joy, contentment, resignation, grief, shock, fear, and anger as experiences of arousal and hedonic tone that result from the interaction of two behavioral dimensions (dominance-submission and approach-avoidance) and two physiological dimensions (pleasure-pain and sympathetic-parasympathetic arousal).

Thompson and Meltzer (1964) and Davitz (1964) conducted studies of encoding/decoding of emotions that utilized specific emotional categories, while Shennum (1976) and Buck, Savin, Miller, and Caul (1972) utilized emotional dimensions (pleasant-unpleasant). Although both appear to be legitimate styles of approaching research in this area, Fromme (1977) appears to have overcome the dilemna of choosing one or the other approach by combining both into a single model. Figure 1 demonstrates Fromme's (1977) model.

In summary, although emotions are a focal point within psychology and are an important part of the person-perception literature, few clear, definitive statements can be made about the topic on the basis of present research. Because of the subjective nature of the emotional experience, there is much controversy and conflict in the existing literature concerning the value of scientific study of discrete emotions or the link between emotions and personality functioning. However, recent improvements in measurement and statistical techniques have made a re-examination of emotion a potentially meaningful endeavor in attempting to understand human behavior, specifically within the area of person perception.

The Face as a Stimulus in Nonverbal Communication and Person Perception

Darwin (1872) held that facial expressions were a function of the

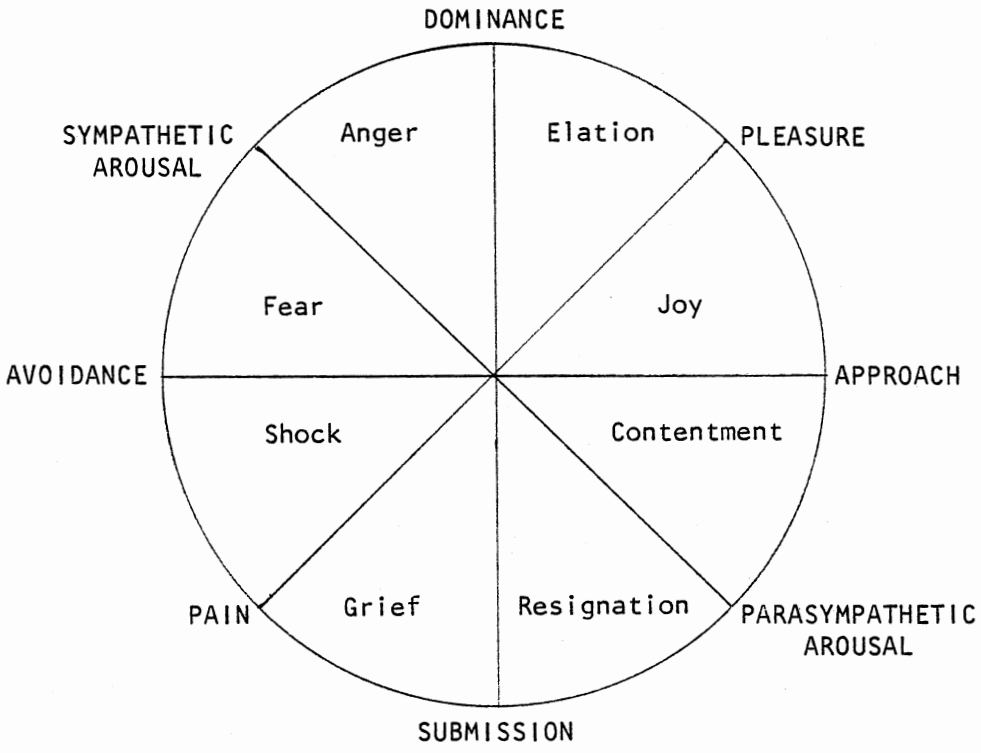

Figure 1. The Circular Structure of the Emotions (Fromme, 1977)

evolutionary process and served as a reflection or communication of internal states. While the whole body served as a visual cue and this was often accompanied by vocal cues, individual parts of the body played signifcant roles in primate communication (Altmann, 1967). Many contemporary authors (Marler, 1965; Van Hooff, 1962, 1967; and Hinde and Rowell, 1962) have noted the importance of the face in primate communication. Izard (1971) reviewed the evolution of facial expression and concluded that facial expressions have an evolutionary-biological basis. Izard reviewed theory and research on the evolution of facial expression and concluded that facial neuromuscular mechanisms, reflexive reactions, and "emotions" were phyletically continuous and compared facial expressions in human and non-human primates. Concurrently, but independently Izard (1971), Ekman, Friesen, and Ellsworth (1972), and Tomkins and McCarter (1964) demonstrated that several fundamental emotions were universal across several diverse cultures. Individuals were able to encode and decode facial expression of fundamental emotions independent of their cultural background. Other authors (Charlesworth and Kreutzer, 1973; and Vine, 1973) have reviewed the importance of the face as a social stimulus in the infant and child's social development.

Paul Ekman and Wallace V. Friesen are generally recognized as authorities in the area of facial expression, having published Emotion in the Human Face (subtitled Guidelines for Research and an Integration of Findings) in 1972, and Unmasking the Face (subtitled A Guide to Recognizing Emotions from Facial Expressions) in 1975. They also constructed the Facial Action Coding System (FACS), a method for the objective description and measurement of facial expressions or movements, cataloging and defining emotional expression for 6 primary as well as 33 blended emotions.

Ekman and Friesen (1975) state that the facial appearance of the six emotions (surprise, fear, disgust, anger, happiness, and sadness) they have extensively researched are universal across sex, age, and culture and that observers can accurately judge both spontaneous and deliberate facial expressions of these feelings. The authors cited other researchers who found identical results even when different methods were used or when the researchers were initially highly skeptical of the concept of universality of facial expression of emotion.

Ekman and Friesen (1975) further state that although universality exists, there is variance across cultures. What may elicit or evoke a specific emotion may differ from one culture to another. Additionally, custom or convention may dictate the expression of felt emotion in terms of suppression, substitution, or exaggeration.

The terms "encoding" and "decoding" refer to the process of spontaneous or deliberate facial expression of emotion and recognition of facial expressions respectively. These terms are also used for auditory expression of emotion, but are restricted in this study to nonverbal communication of emotion as displayed upon the face.

Personality Correlates of Encoding and Decoding

Despite the acceptance of the universality of encoding and decoding, individual differences are apparent and are presumably related to personality characteristics, functional limitations, and perhaps to one's overall mental health. Research in this area tends to be contradictory, however.

Thompson and Meltzer (1964) asked 60 male and female encoders to

express 10 emotions to four decoders or judges seated across a table. Encoders were instructed to enact each of the 10 emotions for 15 seconds. Accuracy scores for the 10 emotions were intercorrelated as well as correlated with subjects' California Personality Inventory scores. The author reported that subjects differed greatly in accuracy scores; that accuracy scores yielded low positive intercorrelations across emotion categories but that accuracy scores were only correlated with CPI scores at approximately chance levels.

In an experiment concerned with physiological arousal and overt emotional expression, Lanzetta and Kleck (1970) asked subjects to judge videotapes of their own or others' responses to a shock or nonshock condition on the basis of nonverbal cues. Results showed that judges were somewhat able to determine affective arousal on the basis of nonverbal cues. An interesting note is that subjects were equally proficient in judging videotapes of their own and others' affective arousal states and that their proficiency did not improve with immediate feedback and punishment for errors. An important result of this study was the finding that those subjects that were accurate in judging others were difficult for others to judge. Conversely, those subjects that were poor judges were easy for others to judge. This inverse relationship between encoding and decoding emotional arousal raises some intriguing questions regarding person perception. Lanzetta and Kleck suggested that some individuals may have been punished for affect expression during socialization and consequently learned to inhibit effectively expression of emotions. The resulting arousal over conflict between expression and inhibition of expression had sensitized these individuals that have learned to internalize their emotions and has resulted in a more accurate perception of others' emotions as a function of their conflict regarding affect display.

Buck, Savin, Miller, and Caul (1972) administered (1) the Eysenck Extroversion-Introversion Scale, (2) the Janis and Field Self Esteem Scale, (3) the Byrne Repression-Sensitization Scale, (4) the Alpert and Haber Test Anxiety Scale, and (5) the Crowne-Marlow Social Desirability Scale to 20 female subjects. Subjects were divided into 10 encoder-decoder pairs. Encoders viewed 25 slides of five types: sexual, scenic, children-mothers, disgusting-horrible, and unusual-interesting. Encoders were monitored by decoders, using a concealed closed-circuit television system. Encoders were asked to view each slide for ten seconds, to verbally describe their emotional response, and then rate their reaction on a 9-point pleasant-unpleasant scale. Decoders were asked to monitor the encoders' emotional response on a 9-point scale. This procedure yielded an accuracy score for the percentage of slides correctly categorized by the decoders and an accuracy score based on the correlation between the encoders' and decoders' pleasantness ratings. Analysis of the data suggested that nonverbal communication as measured by the pleasantness index was not significantly related to any of the personality measures. There were positive relationships between categorization accuracy and personality measures, however. For encoders, positive correlations were found between accuracy of categorization of the 25 slides into five groups and extroversion ($r = .62$), between accuracy and test anxiety ($r = .85$), and between accuracy and debilitating test anxiety ($r = .65$). For encoders, accuracy of categorization based on decoding of the encoders' expression was correlated with self-esteem ($r = .64$).

In a similar study, Buck, Miller, and Caul (1974) used male and female subjects in all possible combinations of encoder-decoder pairs.

Results indicated that (1) female encoders were more accurate than male encoders, (2) female decoders were not significantly more accurate than male decoders and (3) personality measures were not related to encoding and decoding.

Cohen and Rau (1972) compared decoding accuracy for depressed and non-depressed subjects. Only minimal differences between groups' decoding scores were found when subjects were asked to look at photographs and rate them as sad, thoughtful, contented, or happy. Apparently, decoding accuracy is not seriously affected by one's emotional state.

Zaidel and Mehrabian (1969) attempted to discover personality correlates of encoding and decoding in combined visual and auditory communication. After administering the Crowne-Marlow Social Desirability Scale to a large group of potential subjects, the authors selected the three highest and lowest males and females to encode five degrees of positive and negative attitudes. Thirty-six male and thirty-six female subjects were grouped evenly into high and low approval-seeking groups. These subjects then decoded the twelve encoders' visual and vocal expressions. Decoding accuracy scores were similar between the two groups, but there were encoding differences among the high and low approval-seeking encoders. Low approval-seeking subjects were more accurate encoders, particularly in encoding negative attitudes. High approval-seeking subjects were more accurate in encoding positive attitudes, but low approval-seeking subjects had overall higher encoding accuracy scores.

Wolitsky (1973) compared 36 field independent and dependent subjects on a task involving the discrimination of affective expression and implied meanings. In the Feldstein Affect Judgement Test, subjects listened to tape-recorded passages that convey the particular affect of anger,

depression, fear, hate, joy, nervousness, sadness, and a neutral condition. In the Sundberg Test of Implied Meanings, subjects listened to tape recorded statements that were read so as to express a particular implicit meaning (e.g., simple fact, emphasis, etc.). In this study, field independent subjects were significantly more able to discern the emotional tone or implied meanings in the statements they heard. Under specific instructions to detect overt or subtle emotional responses in others, field dependent subjects performed significantly worse than field independent subjects. If the field dependent subjects were more attuned to the stimuli as other writers found, then these subjects perceived the stimuli and then drew the wrong conclusions about affect and meanings. Apparently, attention to and memory for detail is not equivalent to understanding and communication.

Shennum (1976) looked at field independence as a perceptual style. Using 40 adult subjects, Shennum asked subjects to view pictures while videotaping their facial expressions. Subjects were rated as expressive or non-expressive, based on whether or not judges could accurately determine if a particular subject was viewing a pleasant or unpleasant picture or scene. Subjects viewed pictures or scenes that were pleasant (e.g., person(s) in picture showing interest, happiness, tenderness, etc) or unpleasant (e.g., grief, fear, suffering). Shennum took the extremes in the distribution of expressiveness and found that the nonexpressive subjects were significantly more field dependent than the expressive subjects. Shennum concluded that perceptual style plays a role in nonverbal behavior and in the effects of perception on behavior in general.

The conflicting results described above are characteristic of studies attempting to relate personality measures and facial expression of emotion.

In general, few studies have found clear, replicable relationships. Whether encoding and decoding of emotion is essentially independent of personality characteristics of if these inconsistent and vague results are the result of methodological problems remains to be seen. There is sufficient support for such a relationship to warrant further research in this area.

Sex Differences in Encoding and Decoding

A number of studies involving encoding and/or decoding support the popular view that females are more accurate communicators than males. Although Izard (1977) does report sex differences in others' research, he did not specifically discuss sex differences or personality correlates as sources of individual differences in accuracy. Ekman and Friesen (1975) also did not include sources of individual differences in their book concerning emotions and the face. Perhaps these authors' choosing not to address these issues in depth reflects the ambiguity and contradictions of the available research.

Encoding

Buck, Savin, Miller, and Caul (1972) and Buck, Miller and Caul (1974) reported that females were more accurate encoders than males when the judges' task was to determine whether the encoding subject was viewing a pleasant or unpleasant slide. No significant sex differences were reported for decoding; however, Thompson and Meltzer (1964) reported males were more accurate encoders than females for several specific emotions, but that across a number of emotions, males were only slightly more accurate. Zaidel and Mehrabian (1969) also reported sex differences. Females were more accurate encoders of negative attitudes, while males were more

accurate encoders of positive attitudes. Overall, females were more accurate. Drag and Shaw (1967) reported that females were more accurate encoders across both positive and negative emotions.

Decoding

Zuckerman, De Frank, Hall, and Rosenthal (1976) reported that females were more accurate decoders in a study utilizing the Miller (1967) paradigm. Sweeny and Cottle (1976) found female graduate students were more accurate decoders (regardless of their field of study) when subjects were asked to describe emotional characteristics of photographs. Safer (1982) reported that females were more accurate decoders when subjects compared pairs of slides of faces depicting emotion as "same" or "different". Safer first flashed one slide on the center of a screen, then followed with another slide on the extreme left or right side of the screen to restrict the visual input to either the right or left hemisphere only. Safer concluded that females use both hemispheres to interpret emotion, while males primarily use the right hemisphere. The hemispheric differences are described as "verbal codes" or labels for the left and "imagery codes" for the right hemisphere. Females were more accurate decoders because they were four percent more accurate in decoding slides presented to their left hemisphere. While this difference is small, it is statistically significant. Safer stated that differences could be innate or could be the result of early conditioning in which male children and discouraged from verbally empressing their emotions, thus not enabling an early link between hemispheres.

It is readily apparent from this brief review of recent research that sex differences in encoding and decoding are not consistently found. It

is possible that the popular view of female's superior communicative ability is erroneous or that current research is confounded by techniques that are not sufficiently sensitive or consistent from one researcher to another. As is most often the case when research disagrees or fails to "prove" folklore, it is likely the inadequacy of the research methods utilized.

Statement of the Problem

The areas of person perception and encoding/decoding of facial expression of emotion are both important areas that are each clouded by controversy and methodological problems in the literature. Emotional communication, specifically facial affective encoding and decoding, is a subset of the more general field of person perception. While it is logical to assume that facial affective encoding and decoding play a major role in an individual's formations of perceptions of others and perceptions of others' views of oneself, this relationship has not been empirically demonstrated. This study attempts to demonstrate empirically that facial encoding and decoding are a significant aspect in the formation of person perceptions. This study also attempts to determine the role of introversion-extroversion, neuroticism, and field dependence-independence in these areas.

The exploratory nature of this study and the use of a dependent measure that has not been widely investigated, validated, or standardized defines this study as primarily an investigation rather than a more traditional testing of a set of precise directional hypotheses. Instead, what will be investigated is a series of expectations of relationships among variables. These expectations were established on the basis of both previous evidence and logical assumptions. While these expectations may be

treated similarly to hypotheses, analyses or results will be conducted to hypotheses, analyses of results will be conducted such that unexpected findings can be discussed productively. Consequently, all tests of correlational significance will be two-tailed tests of probability.

The first purpose of this study is an attempt to replicate and extend previous studies that have found sex differences in encoding and decoding accuracy. Previous studies have generally examined only encoding or decoding accuracy. The few studies that have examined encoding and decoding simultaneously have failed to differentiate between same and opposite sex pairs of encoders and decoders. The majority of the studies (Buck, Miller & Caul, 1974; Drag & Shaw, 1967) have found females to be better communicators of emotion, although several other studies (Thompson & Meltzer, 1964; Zaidel & Mehrabian, 1969) have found males to be better expressors of several specific emotions. This study will attempt to establish patterns of encoding and decoding accuracy in terms of sex differences, including same and opposite sex pairs of encoders and decoders. It is expected that females will have higher accuracy scores than males for both encoding and decoding accuracy.

The second purpose of this study is an attempt to demonstrate that decoding accuracy is an important component in person perception concepts such as Accuracy (one's prediction of others' views of oneself) and Empathy (one's predictions of others' views of themselves). The rationale for this expectation states that one must be able to decode others' emotional expressions accurately in order to make accurate predictions regarding what others perceive about oneself of themselves. Correlations of subjects' decoding accuracy scores and GPT Accuracy and Empathy scores are expected to be positive and significant.

The third purpose is an attempt to demonstrate that encoding accuracy is an important component in the person perception concepts of Interpersonal Openness (others' predictions of one's view of them), Personal Openness (others' predictions of one's view of oneself), and Felt Openness (one's predictions that others agree with one's self rating). The rationale for these expected relationships states that one must be able to encode emotions accurately in order for others to be able to make accurate predictions of one's view of oneself and one's view of others. It is also expected that the ability to encode accurately will be related to the prediction that others agree with one's self view. If one cannot or chooses not to encode accurately, one cannot expect others to view oneself as one views himself or herself. Correlations of encoding accuracy and the GPT measures of Openness are expected to be positive and significant. Although one can be open and expressive to others in a variety of ways, this expectation suggests that facial encoding of emotion is a primary mode of communication of reactions to others.

The fourth purpose of this study is an attempt to demonstrate that encoding accuracy and the person perception concepts of Openness are positively correlated with extroversion, while decoding accuracy and the person perception concepts of Accuracy and Empathy are positively correlated with introversion. Buck et al. (1972) found a correlation between encoding accuracy and extroversion (r = .62), but no significant correlation between decoding accuracy and extroversion. Buck et al. (1974) reported results that indicated that introverts tended to be accurate decoders, while extroverts tended to be accurate encoders. The rationale for the expected correlational results states that extroverts would be likely to encode more freely and would be more openly expressive of the self and

reactions to others, while introverts would be more likely to be less expressive (less open) and therefore less predictable by others. Conversely, it is often assumed that introverts are more attuned to the expressions of others in terms of the perceived importance of the impact of interpersonal or environmental cues upon the introvert. This suggests that introverts would tend to have higher decoding accuracy scores and to be more adept at making predictions regarding the views of others. The dual nature of the fourth set of expectations is based both on previous research (encoding accuracy and extroversion) and logical assumptions. Correlations of encoding accuracy, person perception concepts of Openness, and extroversion are expected to be positive and significant. Correlations of decoding accuracy, person perception concepts of Accuracy and Empathy, and introversion are expected to be positive and significant.

The fifth purpose of this study is an attempt to demonstrate that field dependence-independence is an important correlate of both encoding and decoding accuracy. Wolitzky (1973) found that field independent subjects were significantly more accurate in decoding auditorially expressed emotions, while Shennum (1976) found that field independent subjects were significantly more accurate in encoding facially expressed emotions. Based on these two previous studies, it is expected that correlations of field independence and encoding and decoding accuracy will be positive and significant.

The sixth purpose of this study is to conduct further exploratory analyses in an attempt to discover relationships among the variables of encoding accuracy, decoding accuracy, Eysenck Personality Inventory Scales, field independence, and sex of subjects:

1. Predictors of encoding and decoding accuracy will be identified using multiple regression analyses; and

2. Factor analysis procedures will be utilized to identify the factorial structure of the data matrix.

CHAPTER II

METHOD AND PROCEDURES

There were four phases of data collection. Phase I involved the development of a set of stimulus slides of expression of facial affect. Phase II involved recruitment of experimental subjects and collection of encoding accuracy scores, decoding accuracy scores, Eysenck Personality (EPI) data, and Embedded Figures Test scores of field dependence-independence. Phase III consisted of subjects meeting in groups of two males and two females, interacting for 45 minutes, and completing the Group Perceptions Test. Phase IV consisted of judging the accuracy of the subjects' encoding efforts.

Phase I: Development of Stimulus Slides

The set of stimulus slides was developed for previous research projects and was made available to this author. Volunteers from an intermediate acting class at Oklahoma Theater Center, Oklahoma City, Oklahoma, participating in a class exercise in nonverbal expression of emotion were photographed while expressing the eight emotions as described by Fromme (in press). Volunteers were given definitions of the eight emotions along with brief scenarios to facilitate their role-playing. Photographs were taken from a distance of eight feet with a tripod-mounted Konika T-3 camera.

These volunteers consisted of ten male and ten female Caucasians with an age range of 18 to 59. This original set of slides was screened and the slides of the most expressive six males and six females were selected as the set of experimental slides. The twelve actors expressing (encoding) the eight emotions resulted in a set of 96 slides of facial affect that was used as stimuli for experimental subjects.

Phase II: Subject Recruitment and Data Collection

Subjects

Subjects were 36 male and 36 female Caucasian undergraduate students enrolled in a summer semester at Oklahoma State University. Encoding accuracy scores, decoding accuracy scores, and EPI scores were obtained from these subjects. Eight of these 72 subjects failed to complete the experimental procedures, resulting in a total of 32 male and 32 female subjects being utilized in this study.

Subjects were recruited from psychology classes where they were asked to participate in a research project concerning how we learn about each other's attitudes and feelings. They were given extra course credit for their cooperation which involved approximately two hours and were clearly given the option to drop out at any time without loss of extra credit.

Data Collection

EPI. Subjects were met in groups of four or less and were administered the Eysenck Personality Inventory (EPI).

Encoding Data. Subjects were then individually photographed encoding the same eight target emotions used in the stimulus slides. A tripod-

mounted 35mm Nikon F camera with f1.4 lens was used and care was taken so that photographs of subjects were equivalent in terms of focal distance and lighting. The photographs were made with color film and natural lighting was used. This procedure closely approximated that used by Ekman and Friesen (1967) and provided an encoding score for each emotion as well as an overall encoding score for each subject.

Subjects were asked to stand in the marked area facing the camera and the following instructions were given to each subject:

> This part of the project involves taking photographs of each of the participants. Rest assured that none of your instructors, classmates, or friends will ever see these photographs. I need pictures of you while you are imagining that you are experiencing various emotions. I will first tell you which emotion to express and then I will describe a short scene appropriate to that emotion. I will then ask you to practice imagining yourself in that situation and experiencing that emotion. When you feel ready to go ahead I will turn around (away from the subject), count to four, and then take the picture. Please pretend that the camera is the person whose actions I will be describing. Please relax and be sincere. Remember that no one outside this project will ever see your photographs.

The eight scenes were presented as follows, one at a time, and were randomized for each subject:

1. ELATION: A display of excited ecstasy or great delight.

   Imagine that you are about to win a prize for which you have been competing with all your heart and you feel very elated.

2. JOY: A display of happiness or delight.

   Imagine that you are just greeting a very close friend that you have not seen in years and you feel very joyous.

3. CONTENTMENT: A display of satisfaction, well-being, or fulfullment:

   Imagine that you have just finished a satisfying day, and you feel warm and very satisfied.

4. RESIGNATION: A display of reluctance, acquiescence, or giving in.

   Imagine that you have just been given a traffic summons which will require you to appear in court and pay a heavy fine.

5. GRIEF: A display of sorrow, misery, or distress.

   Imagine that you have just been told that a close family member has just died and you feel much grief.

6. SHOCK: A display of being dazed, frozen, or stunned.

   Imagine that you have just opened your utility bill for the month. It shows that you owe $530.26. You cannot afford to pay this, and you don't know what to do.

7. FEAR: A display of fright, dread, or apprehension.

   Imagine that you are crossing the street and see a car coming at you at a high rate of speed. You are very afraid and you are preparing to leap aside.

8. ANGER: A display of wrath, rage, or fury.

   Imagine that someone has just been rude and insulting to you and you are extremely angry.

Subjects were asked if they felt they were expressing the appropriate emotion when the shutter clicked. If not, the procedure was repeated until the subject was satisfied with his or her expression. The order of requested emotion encoding was randomly presented to each subject to preclude an order effect of encoding. This procedure closely approximated the procedures used by Ekman, Friesen, and Ellsworth (1972) and Fromme and Schmidt (1972).

Decoding Data. Subjects then completed the decoding procedure involving the 96 stimulus slides. The room utilized for decoding contained student desks, a 35mm slide projector, and a reflectorized portable projection screen. The following instructions were given to the subjects:

> My name is ----- -----. As you know, this research project concerns how we learn about each other's attitudes and feelings.

> In this part of the project, I would like you to view some slides of people who are expressing various emotions. On the desk in front of each of you is a booklet of paper with rows numbered from 1 to 96 and columns labeled with 8 different emotions. When I show a slide, I will call out its sequential number. I will show each slide for 10 seconds. Please place a checkmark in the column which you feel best describes the emotion being expressed by the person in the slide. Please consider each slide carefully, but work quickly and quietly.

The subjects were then shown the 96 slides which had been arranged randomly. Encoded slides were alternated with blank slides to provide illumination for the subjects to mark their answer booklet. Following the 10-second exposure subjects were provided with 10 seconds of illumination and this procedure appeared to provide ample time for both viewing and rating the slides. Subjects' decoding scores were derived by summing the number of emotions correctly identified (decoded) on the actors' faces.

EFT Data. Subjects were individually administered Form A of the Embedded Figures Test (EFT) of field dependence-independence (Witkin, 1969). These scores were obtained while subjects were waiting to be photographed or had been photographed and were waiting for the decoding procedures.

Phase III: Small Groups

Interactions

Subjects were temporarily dismissed following Phase II and were later assigned to four-person groups of two males and two females. Subjects were asked if they knew each other as a criterion for group assignment to insure that group members were not familiar with each other. Four-person groups were asked to get to know each other as well as they could in 45 minutes of verbal interaction. Group interactions tended to be casual and lively with conversations including their experiences with earlier

phases of this and other research projects, classes, instructors, entertainment, and exchange of historical information.

The formation of four-person groups is a requirement for the administration of the Group Perceptions Test in which individuals rate themselves and each other on a series of ten bi-polar adjectives. These ratings form the basis for the measures of person perception.

Group Perceptions Test (GPT)

Following the group interactions, subjects completed the Group Perceptions Test (Appendix A). Subjects were asked to make four ratings across ten bi-polar pairs of adjectives. Subjects rated: (a) how they saw themselves, (b) how they saw each of the other group members, (c) how they would predict how each of the other group members saw them, and (d) how they would predict how each of the other group members saw themselves.

In order to derive the measures of person perception, various combinations of these raw scores were correlated and transformed according to mathematical formulas. Fifteen interpersonal perceptions scales resulted, some of which paralleled concepts found in the literature (empathy, stereotype accuracy, accuracy, assumed similarity, openness), while others appear to have potential utility (congruence, stereotype empathy, personal openness, felt openness, perceived realism, commonality, other acceptance, concurrence, perceived concurrence, and conformity).

These scales were derived by transforming intercorrelations between various combinations of the raw scores into Z scores based on three formulas. First, the raw scores were classified as shown in Figure 2. The four classifications of raw scores are S_i, O_{ij}, SO_{ij}, and OS_{ij}. The first subscript indicates who is making the rating or prediction. The

second subscript indicates who is being rated or whose score is being predicted. The subscripts i and j refer to the subjects' seating position in the group. Raw scores were correlated and transformed according to one of the following formulas, where X and Y are any two raw scores:

$$f(X,Y) = \frac{\sum_{j \neq 1} z(r(X,Y))}{3} \quad . \qquad (1)$$

Perception	My view of me Self view (S_i)	My view of you Other view (O_{ij})
Metaperception (predicted other perception)	My view of your view of me Self as Other sees me (SO_{ij})	My view of your view of you Others' Self view ($\overline{OS}_{ij}$)

Figure 2. Classification of Group Perceptions Test Raw Scores

This f function (Formula [1]) yields a score based on the mean Fisher z transformation of correlations between an individual's ratings or predictions of the other group members and ratings and predictions by each of the other three group members. For instance, if one wanted to determine the degree to which individual subjects can predict how the other individuals in the group rate themselves, the X variable in Formula (1) would be OS_{ij}, which represents the individual predictions of other group members' self ratings. The Y variable would be the other group members' actual self ratings, S_j, and Formula (1) then yields the Empathy Score

(GPT scale 3). The following GPT scales were derived using Formula (1) or the f function:

1. Congruence (CG): degree to which one rates others as they are perceived rating oneself.

$$CG_i = f(O_{ij}, SO_{ij})$$

2. Accuracy (A): degree to which one can predict how others rate oneself.

$$A_i = f(SO_{ij}, O_{ji})$$

3. Empathy (E): degree to which one can predict how others see themselves.

$$E_i = f(OS_{ij}, S_j)$$

4. Perceived Realism (PR): degree to which others predict that one rates oneself as they would rate one.

$$PR_i = f(O_{ij}, OS_{ji})$$

5. Commonality (CM): degree to which others rate themselves as similar to one.

$$CM_i = f(S_j, OS_{ji})$$

6. Other Acceptance (OA): degree to which one rates others as they rate themselves.

$$OA_i = f(O_{ij}, S_j)$$

7. Concurrence (CN): degree to which one rates others as they are perceived rating themselves:

$$CN_i = f(O_{ij}, OS_{ij})$$

8. Perceived Concurrence (PC): degree to which others predict that one rates them as they rate themselves.

$$PC_i = f(SO_{ji}, S_j)$$

9. Interpersonal Openness (IO): degree to which others can predict one's rating of them (reflects feedback).

$$IO_i = f(SO_{ji}, O_{ij})$$

The second formula yields a Z score which reflects the correlation between the means of any two types of raw scores. For instance, to determine a subject's generalized knowledge of how other group members rate themselves, one would compare the mean of the person's predictions of other group members' self views (OS_{ij}) with the mean of those others' actual views of themselves (S_j). In this case, $X = OS_{ij}$ and $Y = S_j$ in the following formula:

$$g(X,Y) = Z(r(\frac{\sum_{j\neq i} X}{3}, \frac{\sum_{j\neq i} Y}{3})) \qquad (2)$$

The following GPT scales are computed using Formula (2):

10. Stereotype Accuracy (SA): degree to which the mean SO prediction correlates with the mean of how others actually perceive one (correlated over the 10 different Likert items on the GPI).

$$SA_i = g(SO_{ij}, O_{ji})$$

11. Stereotype Empathy (SE): degree to which the mean OS prediction correlates with the mean of the others' actual ratings of themselves.

$$SE_i = g(OS_{ij}, S_j)$$

The h function, or third formula, yields a Z score based on the intercorrelation between the self rating and the mean of any other rating. For instance, if it is desired to find the degree to which the rest of the group as a whole is aware of an individual's self concept, the mean OS_{ji} score (their average prediction of his self concept) would be compared with that individual's actual self rating, S_i, yielding the Personal Openness Score on the GPT. The following GPT scales were computed using this formula:

$$h(X,Y) = \frac{a(r(\sum_{j \neq 1} X,\ Y))}{3} \qquad (3)$$

12. Personal Openness (PO): degree to which others can predict one's self concept.

$$PO_i = h(OS_{ji},\ S_i)$$

13. Felt Openness (FO): degree to which one predicts that others agree with one's self perception.

$$FO_i = h(SO_{ij},\ S_i)$$

14. Assumed Similarity (AS): degree to which one rates oneself as similar to others.

$$AS_i = h(O_{ij},\ S_i)$$

A separate formula is used to compute the last GPT scale, Conformity.

15. Conformity (CF): degree to which one's judgment of others conforms to the group's judgment of those others.

$$CF_i = \frac{\sum_{j \neq i} \sum_{k \neq j,i} z(r(O_{ij},\ O_{kj}))}{6}$$

This formula represents the correlation between one person's ratings of others in the group with ratings of those same others by the other group members.

Methodological Problems in the Group Perceptions Test. The scale scores derived for each subject are based on a combination of raw scores by two or more group members (e.g., Accuracy is a function of how one predicts another would rate oneself as well as how another actually rates oneself). Consequently, an individual's Accuracy score is not necessarily stable from one situation to another and only measures an individual's ability to make accurate predictions in that one situation. While it would be ideal to be able to determine an individual's ability to make accurate predictions across a wide variety of situations and time, such a measure of prediction has yet to be developed. Subjects' person perception scores in this study are necessarily a function of the group in which they were placed and could conceivably have been different if they had been placed in a different group. Additionally, the interaction of our subject with three others prior to collection of the perception ratings may lead to a dependency among their scores. Despite these limitations of the Group Perception Test, previous research suggests that these measures of person perception are sufficiently valid for use as indicators of individuals' awareness of how well they see others and are seen by others.

An additional methodological problem in the Group Perceptions Test involves the dependency among scales. Table XIX (Appendix B) presents the intercorrelations of the GPT scales. A review of Table XIX shows that the GPT scales are highly intercorrelated, suggesting that there is some overlap or redundancy in these measures. This factor must be taken

into account when procedures such as regression analyses and factor analyses are utilized.

Phase IV: Judgment of Encoding Accuracy

The photographs of the 64 subjects encoding eight emotions resulted in 512 slides that were presented to a panel of six male and six female judges who were graduate students in clinical psychology and were not acquainted with the subjects. Judges followed decoding procedures that were identical to those of the subjects decoding the stimulus faces in Phase II. These ratings yielded subjects' encoding accuracy scores for each emotion as well as an overall encoding accuracy score for each subject by summing across judges the number of times a subject's encoded emotions were correctly identified by the judges. Each subject's encoding accuracy score had a potential from 0-96 (12 judges identifying 8 emotions).

Description of Variables

Independent variables included:

1. sex of the stimulus faces;
2. sex of the subjects; and
3. sex of the judges.

Dependent variables included:

1. encoding accuracy scores;
2. decoding accuracy scores;
3. fifteen scale scores from the Group Perceptions Test;
4. three scale scores from the Eysenck Personality Inventory; and
5. field independence scores from the Embedded Figures Test.

Sequence of Data Collection

The sequence in which the data were collected was determined primarily by convenience. In retrospect, it may have been more appropriate to counterbalance or randomize the sequence of tasks, particularly the encoding task, the decoding task, the administration of the EPI, the administration of the EFT, and the group interaction/Group Perceptions Test process. While there is no obvious reason to believe that the order of data collection may have influenced subjects' responses, an order effect may have occurred that may have distorted the results of the analyses.

CHAPTER III

RESULTS

Sex Differences in Decoding and Encoding Accuracy

Decoding Accuracy

Decoding Accuracy scores were derived by summing the number of times a subject accurately identified the emotions expressed on the slides of the actors' faces. Each subject's decoding accuracy score had a potential range of 0-96 (12 actors expressing 8 emotions). Since previous research has suggested that females are more accurate decoders, Table II presents the mean decoding accuracy scores by sex of subject and sex of stimulus faces decoded by the subjects.

The first set of expectations stated that females would have higher decoding accuracy scores than males. Two-way analysis of variance procedures were utilized to determine if significant sex differences existed in subjects' decoding accuracy of male and female stimulus faces. Table II shows that female decoders were more accurate than male decoders (56.50 *vs* 52.41). Analysis of variance results presented in Table III show this difference to be significant, F (1, 62) = 6.53, $p < .025$, as expected. However, Table III also shows a significant sex of subject X sex of stimulus interaction, F (1, 62) = 4.04, $p < .05$. This interaction was further explored with a simple main effects test which showed that although females achieved significantly higher decoding accuracy scores

TABLE II

MEAN DECODING ACCURACY BY SEX OF SUBJECT AND SEX OF STIMULI

Stimuli	Female Subjects	Male Subjects	Combined
Male	24.28	23.38	47.66
Female	32.22	29.03	61.25
Combined	56.50	52.41	54.45

TABLE III

ANALYSIS OF VARIANCE: SUBJECTS' DECODING ACCURACY BY SEX OF STIMULI

Source	SS	df	MS	F	p
Sex of Subjects	136.12	1	136.12	6.53	<.025
Between	1290.75	62	20.81		
(Total Between	1426.00	63)			
Sex of Stimuli	1532.76	1	1532.76	156.38	<.001
Sex of Subject X Sex of Stimuli	39.57	1	39.57	4.04	<.05
Error Within	607.65	62	9.80		
(Total Correlated	2180.00	64)			
Total	3606.00	127			
Summary Table for Simple Main Effects					
Male Stimuli	13.14	1	13.41	0.85	ns
Female Stimuli	162.56	1	162.56	10.62	<.005
Pooled Error	1898.40	124	15.31		

when decoding female stimuli, F (1, 124) = 10.62, $p < .005$, male and female subjects were essentially equivalent in decoding male stimuli. The main effect of sex differences in decoding accuracy must therefore be qualified. Females achieved higher decoding accuracy scores than males as expected, but only when decoding female stimuli. Apparently males' emotional expressions were difficult to decode by both sexes.

Encoding Accuracy

Encoding Accuracy scores were derived by summing the number of times the judges accurately identified the emotions the subjects had been instructed to express (encode). Each subject's encoding accuracy score had a potential range of 0-96 (12 judges identifying 8 emotions). Since previous research has shown that females (subjects) are more expressive and females (judges) are more accurate in judging others' expressions, Table IV presents the mean encoding accuracy scores by sex of subjects and sex of judges.

The first set of expectations stated that females would have higher encoding accuracy scores than males. Two-way analysis of variance procedures were utilized to determine if significant sex differences existed in subjects' encoding accuracy by male and female judges. Table IV shows that female subjects' encoded emotions were correctly identified by judges more frequently than males' encoded emotions (45.60 *vs* 38.63). Analysis of variance results presented in Table V show this difference to be significant, F (1, 62) = 6.79, $p < .025$. Although judges were correctly able to identify female subjects' encoded emotions more frequently than males', male and female judges were equivalent in making correct identifications

TABLE IV

MEAN ENCODING ACCURACY BY SEX OF SUBJECT AND SEX OF JUDGES

Judges	Female Subjects	Male Subjects	Combined
Male	22.63	19.25	41.88
Female	22.97	19.38	42.35
Combined	45.60	38.63	42.12

TABLE V

ANALYSIS OF VARIANCE: SUBJECTS' ENCODING ACCURACY BY SEX OF JUDGES

Source	SS	df	MS	F	p
Sex of Subjects	388.50	1	388.50	6.79	.025
Between	3547.61	62	57.21		
(Total Between	3936.11	63)			
Sex of Judges	1.75	1	1.75	0.11	ns
Sex of Subjects X Sex of Judges	0.38	1	0.38	0.02	ns
Error Within	966.35	62	15.58		
(Total Correlated	968.50	64)			
Total	4904.61	127			

(unlike subjects who showed sex differences in decoding female stimulus faces).

Encoding and Decoding Accuracy

Results show that subjects' decoding accuracy scores ($\bar{x}$ = 54.45, s.d. = 6.73, range = 39-64) are distributed quite differently than subjects' encoding accuracy scores ($\bar{x}$ = 42.12, s.d. = 11.75, range = 16-67). These differences can be looked at in two ways. Either there are fewer individual differences in decoding skills or the selection of actors' faces as decoding stimuli made the subjects' decoding task far easier than the judges' taks of identifying (decoding) the subjects' encoded emotional expressions. Table VI presents the means and standard deviations of subjects' encoding and decoding accuracy scores across the eight emotions utilized in this study. It appears that the emotion of anger was the easiest emotion for subjects to encode and decode accurately.

Encoding, Decoding, and Person Perception

The second set of expectations stated that differences in encoding and decoding accuracy would be reflected by differences on the Group Perceptions Test (GPT).

Decoding, Accuracy, and Empathy

It was expected that decoding accuracy would be positively correlated with Accuracy, Stereotypic Accuracy (one's predictions of others' ratings of oneself), Empathy and Stereotypic Empathy (one's predictions of others' ratings of themselves). Table VII presents the correlations of the GPT scales with both encoding and decoding accuracy scores. Decoding accuracy

TABLE VI

ENCODING AND DECODING MEANS AND STANDARD DEVIATIONS FOR INDIVIDUAL AND COLLECTIVE EMOTIONS

Emotions	Means	S.D.
Encoding		
Elation	5.20	4.14
Joy	4.87	3.17
Contentment	5.31	3.02
Resignation	5.04	3.58
Grief	6.65	3.94
Shock	3.87	3.10
Fear	4.23	3.03
Anger	6.79	4.02
Total Encoding	42.12	11.75
Decoding		
Elation	6.93	2.43
Joy	7.84	2.10
Contentment	7.45	2.13
Resignation	5.23	2.15
Grief	6.07	1.61
Shock	7.01	1.88
Fear	5.04	2.13
Anger	8.82	1.37
Total Decoding	54.45	6.73

TABLE VII

CORRELATION OF GROUP PERCEPTIONS TEST (GPT) VARIABLES WITH ENCODING/ DECODING ACCURACY

Variables	Encoding		Decoding	
	r	p	r	p
GPT				
Accuracy	.29	.01	.28	.02
Stereotypic Accuracy	.32	<.01	.27	.02
Empathy	.33	<.01	.17	.17
Stereotypic Empathy	.40	<.01	.14	.25
Interpersonal Openness	.43	<.01	-.00	.97
Personal Openness	.09	.46	.30	.01
Felt Openness	.01	.91	.05	.68
Congruence	.34	<.01	.02	.84
Perceived Realism	.11	.35	.15	.21
Perceived Similarity	.29	.01	-.09	.45
Commonality	.07	.54	.16	.20
Other Acceptance	.32	<.01	.14	.24
Concurrence	.23	.06	.18	.14
Perceived Concurrence	.29	.01	.09	.43
Conformity	.35	<.01	.01	.92

was significantly positively correlated with Accuracy and Stereotypic Accuracy as expected (r = .28, p = .02 and r = .27, p = .02, respectively) and was positively, but not significantly, correlated with Empathy and Stereotypic Empathy (r = .17, p = .17 and r = .14, p = .25, respectively). The correlation of decoding accuracy and GPT Accuracy suggests that to the degree that one can decode another's emotional expression, one can predict another's rating of oneself.

Encoding and Openness

The second set of expectations also predicted a positive correlation between encoding accuracy and Interpersonal Openness (others' ability to precict one's rating of them), Personal Openness (others' ability to predict one's self rating), and Felt Openness (the degree to which one predicts that others rate one similarly to one's own self rating).

Interpersonal Openness was significantly correlated with encoding accuracy (r = .43, p < .01), suggesting that one's encoding of emotions or reactions to others may facilitate their predictions of one's rating of them. Personal Openness was not significantly correlated with encoding accuracy as predicted (r = .09, p = .46), but was significantly positively correlated with decoding accuracy. This implies that another's ability to predict one's self rating is more dependent on other variables than one's ability to encode expressions accurately. Felt Openness was not significantly correlated with either encoding (r = .01, p = .91) or decoding (r = .01, p = .68).

Additional Correlations of GPT Scales and Encoding and Decoding

Although expectations were not stated regarding the remaining GPT scales, these correlations are also reported in Table VII. Encoding accuracy was significantly positively correlated with an additional six GPT scales including: (1) Congruence (r = .34, p < .01) (the degree to which one rates others as they are perceived rating oneself); (2) Other Acceptance (r = .32, p < .01) (the degree to which one rates others as they rate themselves); (3) Concurrence (r = .23, p = .06) (the degree to which one rates others as they are perceived rating themselves); (4) Perceived Similarity (r = .29, p = .01) (the degree to which one rates oneself as similar to others); (5) Perceived Concurrence (r = .29, p = .01) (the degree to which others predict that one rates them as they rate themselves); and (6) Conformity (r = .35, p < .01) (the degree to which one's rating of others conforms to the group's rating of those others). It is interesting to note that decoding accuracy was significantly correlated with 3 of the 15 GPT scales, while encoding accuracy was significantly correlated with 11 of the 15 GPT scales.

Extroversion, Encoding, Decoding, and Person Perception

The third set of expectations stated that extroversion would correlate negatively with decoding accuracy and the GPT scales of Accuracy, Stereotypic Accuracy, Empathy, and Stereotypic Empathy; but that extroversion would correlate positively with encoding accurcy and the GPT scales of Interpersonal Openness, Personal Openness, and Felt Openness. Table VIII indicates that the concept of introversion-extroversion as measured

by the EPI was not significantly correlated with any of the GPT scales as expected. Table VIII also indicates that decoding accuracy was not significantly correlated with introversion-extroversion as expected, but that encoding accuracy was significantly positively correlated with extroversion as expected (r = .24, p = .05). Subjects scoring as extroverts were more accurate encoders, although this relationship was stronger for females (r = .26, p < .03) than for males (r = .16, p < .18).

TABLE VIII

CORRELATION OF EYSENCK PERSONALITY INVENTORY (EPI) SCALES WITH GROUP PERCEPTIONS TEST (GPT) AND ENCODING/DECODING

Variables	Extroversion		Neuroticism		Lie	
	r	p	r	p	r	p
Encoding	.24	.05	-.19	.12	.07	.56
Decoding	.08	.49	.02	.81	-.04	.69
GPT:						
Accuracy	.00	.98	-.17	.17	-.00	.94
Stereotypic Accuracy	.00	.99	-.20	.10	.03	.76
Empathy	.00	.98	-.21	.08	.15	.22
Stereotypic Empathy	.06	.60	-.28	.02	.03	.76
Interpersonal Openness	.03	.80	-.15	.22	-.00	.99
Personal Openness	.13	.27	-.03	.78	.07	.54
Felt Openness	.00	.98	-.03	.77	.19	.12
Congruence	.02	.81	-.15	.23	-.11	.38
Perceived Realism	.21	.08*	-.11	.37	-.06	.62
Perceived Similarity	-.18	.15	-.24	.05	-.00	.95
Commonality	.08	.51	.03	.79	.15	.23
Other Acceptance	.21	.09	-.11	.38	-.15	.20
Concurrence	.05	.65	-.10	.42	-.08	.49
Perceived Concurrence	.15	.23	-.08	.49	.05	.69
Conformity	.15	.22	-.10	.39	-.16	.20

*p < .05, one-tail.

Field Independence

Field Independence and Encoding/Decoding Accuracy

The fourth set of expectations stated that field independent subjects have higher encoding and decoding accuracy scores. Because there is typically a sex difference in field independence, correlations were utilized for males, for females, and for both sexes combined. Table IX displays the results of these analyses. Correlations of field independence and encoding and decoding accuracy were minimal, suggesting that disembedding skills are not related to one's encoding or decoding accuracy. Apparently, facial expressions are sufficiently obvious that field independence does not give one an advantage in decoding facial expressions.

Field Independence and Person Perception

Although the fourth set of expectations did not predict a relationship between field independence and person perception, the results are included because they are of interest. Despite the results that showed that field independence was not related to encoding or decoding accuracy, field independence was significantly positively correlated with 11 of the 15 GPT scales of person perception. These results are included in Table IX.

Regression Analyses

Additional planned analyses included Step-Wise Maximum R^2 regression analyses separately for each sex that sought predictors of encoding in one analysis and decoding in another. Possible predictors included in

TABLE IX

CORRELATIONS OF ENCODING/DECODING ACCURACY
AND GROUP PERCEPTIONS TEST SCALES
WITH THE EMBEDDED FIGURES TEST
OF FIELD INDEPENDENCE

Variables	EFT	
	r	p
Combined Encoding	-.06	.58
Males Encoding	-.24	.17
Females Encoding	-.04	.80
Combined Decoding	.01	.94
Males Decoding	-.08	.62
Females Decoding	-.02	.88
GPT		
Accuracy	-.24	.04
Stereotypic Accuracy	-.28	.02
Empathy	-.47	<.01
Stereotypic Empathy	-.43	<.01
Interpersonal Openness	-.18	.15
Personal Openness	-.13	.29
Felt Openness	-.29	.01
Congruence	.01	.89
Perceived Realism	-.28	.02
Perceived Similarity	.03	.81
Commonality	-.38	<.01
Other Acceptance	-.29	.01
Concurrence	-.28	.02
Perceived Concurrence	-.36	.01
Conformity	-.26	.03

the regression analyses were the 15 GPT scales, the Introversion-Extroversion, Neuroticism, and Lie scales from the EPI, and the Embedded Figures Test scores of field dependence-independence. Table X presents the best two-variable model found for predicting decoding (e.g., it was at this step that all variables were entered that had a probability of .05). The R-Square for this two-variable model is .18. Table XI presents the best three-variable model for perdicting encoding. The R-Square for this model is .30. Step-Wise Maximum R^2 regression analyses for each sex are included in Table XIV (Appendix B).

Predictors of Decoding Accuracy

Two predictors accounted for 18 percent of the variance in decoding accuracy. Personal Openness (the degree to which others can predict one's self rating/reflects self-disclosure) and the sex of the subject were the best two predictors of decoding accuracy. A subject was more likely to achieve higher decoding accuracy if that person was a female and was willing to self-disclose such that others could predict that subject's self ratings. Table XI presents the best three-variable model.

Predictors of Encoding Accuracy

Three predictors accounted for 30 percent of the variance in encoding accuracy. Stereotypic Accuracy (the ability to predict the mean of others' ratings of oneself), Interpersonal Openness (the degree to which others can predict one's ratings of them), and extroversion were the best three predictors of encoding accuracy. Higher encoding accuracy scores were attained by subjects who tended to give feedback to others, who were able to predict what others perceived about them, and who were extroverted.

TABLE X

STEPWISE REGRESSION FOR PREDICTING DECODING

Variables	B Value	F	p
Intercept	21.006		
Personal Openness	5.730	6.21	.01
Sex	-3.867	6.20	.01
Variance Accounted for:	0.178		

TABLE XI

STEPWISE REGRESSION FOR PREDICTING ENCODING

Variables	B Value	F	p
Intercept	-74.447		
Stereotypic Accuracy	5.821	4.87	.03
Interpersonal Openness	12.471	11.36	.001
Extroversion	0.871	4.64	.03
Variance Accounted for:	0.300		

Predictors of Encoding and Decoding Accuracy by Sex

Additional regression analyses were conducted to discover predictor variables for each sex independently. The results in Table XIV (Appendix B) show that males' and females' encoding and decoding accuracy scores had several different predictors compared to the combined data, but it is not clear precisely what these differences might imply.

Factor Analyses

Factor analysis procedures utilizing Vari-Max rotation were conducted for each sex and both sexes combined. Table XII presents the identified factors for males, and Table XIII presents the identified factors for females. Results for both sexes combined are presented in Table XV (Appendix B). In all three analyses, factors were retained if eigenvalues exceeded 1.00 and factors were identified by variables where loadings exceeded $\pm.30$. The ratio of variables to subjects (21 variables to 32 subjects for each sex, 21 variables to 64 subjects for both sexes) is lower than generally recommended for factor analytic studies. Consequently, these results must be viewed in perspective with other analyses in this study, and must be viewed with some caution in interpreting the results.

Factor Analysis for Males

Five factors were retained. Factor 1 included 9 scales from the Group Perceptions Test and encoding accuracy. Highest loadings included Interpersonal Openness (the degree to which others can predict one's rating of them/reflects feedback), Empathy (the degree to which one can predict another's self rating), and Encoding accuracy scores. Factor 1 is

TABLE XII

VARI-MAX ROTATED FACTOR LOADINGS FOR MALES

Variables	F 1	F 2	F 3	F 4	F 5
GPT					
Accuracy	.16	.09	.93	-.13	.13
Stereotypic Accuracy	.18	.05	.84	-.16	.18
Empathy	.79	.20	.37	-.11	.05
Stereotypic Empathy	.75	.19	.20	.03	.19
Congruence	.47	-.59	.32	.11	.19
Interpersonal Openness	.87	.05	.06	-.13	-.01
Personal Openness	.05	.55	.57	-.03	.30
Felt Openness	.15	.74	.38	-.15	-.13
Perceived Realism	.04	.86	.20	.04	.12
Perceived Similarity	.55	-.64	.22	-.16	-.10
Commonality	.43	.74	.15	-.06	-.22
Other Acceptance	.51	.28	.64	.22	-.07
Concurrence	.09	.23	.88	.12	.07
Perceived Concurrence	.50	.19	.73	.16	-.11
Conformity	.45	-.27	.61	.33	.12
EPI					
Extroversion	.17	.11	-.15	.84	.00
Neuroticism	-.20	-.02	-.05	.01	-.69
Lie	.23	.13	-.16	-.69	.10
EFT					
Field Dependence	-.20	-.54	-.00	-.06	-.32
Decoding	-.05	.06	.46	-.17	.59
Encoding	.69	-.07	.09	.19	.37
Variance Accounted for:	4.18	3.62	4.88	1.61	1.44

TABLE XIII

VARI-MAX ROTATED FACTOR LOADINGS FOR FEMALES

Variables	F 1	F 2	F 3	F 4	F 5	F 6
GPT						
Accuracy	.14	.20	.84	-.05	.02	.23
Stereotypic Accuracy	.19	.03	.85	-.01	.12	.24
Empathy	.79	-.11	.36	.25	.14	.16
Stereotypic Empathy	.73	-.10	.43	.14	.06	.31
Congruence	.59	-.04	.07	-.42	-.17	.16
Interpersonal Openness	.81	.05	.01	-.17	-.14	.25
Personal Openness	.08	.77	.19	.02	-.13	-.07
Felt Openness	.55	.60	-.04	.41	.05	-.07
Perceived Realism	.37	.75	.04	-.03	.19	.01
Perceived Similarity	.48	-.22	.03	-.11	-.29	.52
Commonality	.78	.19	-.02	.29	.28	-.12
Other Acceptance	.80	.22	.29	-.23	-.03	.04
Concurrence	.21	.19	.76	-.02	-.33	.00
Perceived Concurrence	.90	.21	.24	-.02	-.01	-.03
Conformity	.73	.10	.22	-.23	-.32	.07
EPI						
Extroversion	-.04	.57	.13	-.36	.53	.07
Neuroticism	-.12	.16	-.07	.04	.06	-.71
Lie	-.08	.00	.04	.86	-.06	.04
EFT						
Field Dependence	-.47	.09	-.57	-.23	-.13	.19
Decoding	-.02	.02	-.01	.00	.90	-.11
Encoding	-.00	.23	.24	.09	.02	.80
Variance Accounted for:	5.87	2.27	3.02	1.63	1.66	1.85

labeled "Empathic Expressiveness" and suggests that males who encode well also tend to be rather open as well as perceptive of others' view of them.

Factor 2 included six scores from the Group Perceptions Test and the field dependence-independence score. This is a bipolar factor in which Congruence (the degree to which one rates others as they are perceived rating oneself) and Perceived Similarity (the degree to which one rates oneself as similar to others) load in opposition to the scales Perceived Realism (the degree to which others predict that one rates oneself as they would rate one), Felt Openness (the degree to which one predicts that others agree with one's self-perception), Commonality (the degree to which others rate themselves as similar to one), and Personal Openness (the degree to which others can predict one's self concept/reflects self-disclosure). Factor 2 is labeled "Field Independent Individuality." To the degree that males are field independent, they are willing to see themselves as different than others and tend to self-disclose sufficiently for others to make accurate predictions of how rates oneself.

Factor 3 includes 10 of the 15 Group Perceptions Test scales and males' decoding accuracy scores. Highest loadings included Accuracy (the degree to which one can predict others' rating of oneself), Concurrence (the degree to which one rates others as they are perceived rating themselves), and Perceived Concurrence (the degree to which others predict that one rates them as they rate themselves). Factor 3 is labeled "Decoding Accuracy" and indicates that to the extent that males decode facial expressions, they tend to be accurate about others' perceptions of both the self and the others and are sufficiently open that others are aware of their accuracy.

Factor 4 contains three variables including the Group Perceptions Test scale of Conformity (the degree to which one's ratings of others conforms to the group's ratings of others), plus the EPI scales of Extroversion and Lie. Factor 4 is titled "Extroversion" and suggests that to the extent that males tend to be extroverted, they also tend to be honest and to form opinions that are typical of their peers or, conversely, to the extent that males are introverted, they tend to present a positive facade and not to conform to others' views.

Factor 5 contains bipolar variables that include the Group Perceptions Test scale of Personal Openness (the degree to which others can predict one's self concept/reflects self-disclosure) and both Encoding and Decoding accuracy scores as well as field independence and low EPI Neuroticism scores. Factor 5 is labeled "Open Communication" and suggests that to the degree that males are not neurotic, they tend to decode others' expressed emotions accurately and to self-disclose sufficiently for others to perceive them readily.

Factor Analysis for Females

The factor analysis for females is presented in Table XI. Six factors were retained that had eigenvalues greater than 1.00 and were identified by loadings that exceeded $\pm .30$. Factor 1 consists of 11 scales from the Group Perceptions Test and the EFT measure of field independence. Highest loadings included Perceived Concurrence (the degree to which others predict that one rates them as they rate themselves/reflects others' perception of one's acceptance of their self-presentation), Interpersonal Openness (the degree to which others can predict one's rating of them), Other Acceptance (the degree to which one rates others as they

rate themselves), Empathy (the degree to which one can predict how others see themselves), and Commonality (the degree to which others rate themselves as similar to one). This factor is titled "Field Independent Empathy" and it suggests that to the degree that females are field independent, they tend to perceive others accurately and demonstrate that perception to the degree that others are aware of it.

Factor 2 is composed of three Group Perceptions scales and the EPI scale of Extroversion. Highest loadings included Personal Openness (the degree to which others can predict one's self concept), Perceived Realism (the degree to which others predict that one rates oneself as they would rate one), and Felt Openness (the degree to which one predicts that others agree with one's self perception). This factor is titled simply "Extroversion" and it suggests that to the degree that females are extroverted, they tend to be sufficiently open that others can perceive the self-concept.

Factor 3 is composed of five Group Perceptions Test scales and the EFT measure of field independence. Highest loadings include Accuracy (the degree to which one can predict others' rating of oneself) and Concurrence (the degree to which one rates others as they are perceived rating themselves). This factor is titled "Field Independent Accuracy" and it suggests that to the degree that females are field independent, they are accurate predictors of others' perceptions of themselves.

Factor 4 is composed of two Group Perceptions Test scales and the EPI scales of Extroversion and Lie. This is a bipolar factor with loadings of Lie (tendency to naively attempt to create an overly positive view of the self) and Felt Openness (the degree to which one predicts that others agree with one's self-presentation) in opposition to

Extroversion and Congruence (the degree to which one rates others as they are perceived rating oneself). Factor 4 is titled simply "Introversion" and suggests that to the degree that females tend to present a positive facade, then tend to predict that others will accept their presentation, despite the fact that they are introverted and see themselves as different from others or, conversely, to the degree that females are sophisticated and honest, they tend to be extroverted, to not assume that others agree with their self perception, and tend to rate others as they are perceived to be rating themselves.

Factor 5 is composed of loadings on decoding accuracy and extroversion in opposition to the Group Perceptions Test scales of Concurrence (the degree to which one rates others as they are perceived rating themselves) and Conformity (the degree to which one's ratings of others conforms to the group's ratings of those others). Factor 5 is titled "Decoding Accuracy" and implies that females who are accurate, extroverted decoders tend to rate others as they see them, independently of the other's self-perception or the group's perception (or conversely, that introverts who are poor decoders tend to rate others as they are perceived rating themselves and tend to conform to the group's ratings of others).

Factor 6 is composed of encoding accuracy scores, low EPI Neuroticism scores, and the two Group Perceptions Test scales of Perceived Similarity (the degree to which one rates oneself as similar to others) and Stereotypic Empathy (the degree to which the mean of one's predictions of the other's self ratings correlates with the other's actual self rating). This factor is titled "Neuroticism" and implies that to the degree that a female is neurotic she tends to be a poor encoder, to see herself as different from others and to have a poor sense of empathy. Conversely, to

the degree that a female is not neurotic she tends to be a good encoder and to see herself as similar to others as well as being empathic.

Intercorrelations of Encoding and Decoding Accuracy Scores

Although relationships between encoding and decoding accuracy scores for each of the eight emotions were not a focal point in this study, the results are included for discussion and are presented in Tables XVI, XVII, and XVIII (Appendix B).

Decoding Intercorrelations

Of the 28 decoding intercorrelations (excluding the part-whole correlations with total decoding accuracy scores) 4 were significant. One would expect 1.4 of these to be significant by chance alone. While one might assume that the ability to decode one emotion accurately would imply that one would decode other emotions equally well, the data do not support this assumption. Indeed, 11 of the 28 decoding intercorrelations were negative. There appears to be a trend that implies that decoding positive or pleasant emotions is inversely related to the decoding of negative or unpleasant emotions.

Encoding Intercorrelations

Of the 28 encoding intercorrelations, 7 were significant. As with decoding, one would expect 1.4 of these to occur by chance. Again, no clear pattern emerged that would indicate that one's ability to encode one emotion accurately implies that one can encode other emotions equally well.

Encoding and Decoding Correlations

Of the 81 correlations of encoding and decoding accuracy scores (including total encoding and total decoding), 5 were significantly correlated. Four of these could be significant by chance alone.

Encoding and Total Encoding Accuracy Correlations

Of the eight part-whole correlations of individual emotion encoding accuracy and total encoding accuracy scores, only one was significantly correlated, reflecting the lack of trend in the encoding accuracy intercorrelations. The ability to encode any one specific emotion is essentially independent of the ability to encode other emotions accurately.

Decoding and Total Decoding Accuracy Correlations

Part-whole correlations between decoding each emotion and total decoding accuracy suggest that the ability to decode any one emotion is generally independent of the ability to decode other emotions accurately. A review of Tables XVI and XVII shows that three of the eight decoding by total decoding accuracy correlations were significant, while only one of the encoding by total encoding correlations was significant.

CHAPTER IV

SUMMARY OF RESULTS AND DISCUSSION

Summary of Results

Sex Differences in Affective Encoding and Decoding

One of the most consistent findings regarding accuracy of encoding and decoding is that females are more accurate communicators of emotion. Four studies cited in the literature review reported sex differences in encoding; three of those reported females achieved higher scores and the fourth study reported slightly higher scores for males. The present study found significantly higher encoding scores for females whether they were judged by male judges, female judges, or male and female judges combined.

Three studies cited in the literature review reported sex differences in decoding. All three reported females achieved higher scores. This study also found significantly higher decoding scores for females when decoding female stimulus faces. Male and female subjects were essentially equivalent in decoding male stimulus faces.

It is important to reiterate that in this study there were not similar sex differences between subjects and judges. Unlike the subjects, male and female judges were equally accurate in decoding emotional expressions. It is unfortunate that judges were not also asked to decode the stimulus faces. It would have been interesting to determine if the clinical psychology graduate student judges' accuracy scores were equivalent

to or higher than subjects' scores. It would also have been intereesting to determine if male and female judges would have shown a similar lack of sex differences in decoding stimulus faces as they showed in judging subjects. The reader (and the author) is left to speculate regarding why clincial psychology graduate students did not show sex differences in judging as subjects showed in decoding, since the process was identical. Obviously, these two groups of judges and subjects were not drawn from the same population, but the basis for the judges' lack of sex differences in judging subjects' encoded emotions is unclear and could form the basis for another study to explain such variables as level of intelligence, age, field of study, and personality variables.

Extroversion

Among the studies cited in the literature review concerning encoding/decoding and personality measures, Buck, Savin, Miller, and Caul (1972) utilized the Eysenck Extroversion-Introversion Scale (among other personality scales). Buck et al. reported a positive correlation between encoding accuracy and extroversion (r = .62). In the present study, decoding scores were independent of extroversion scores, but encoding was correlated with extroversion significantly for females (r = .26, p = .03), non-significantly for males (r = .16, p = .18) and significantly for males and females combined (r = .24, p = .05). This study replicates the Buck et al. study despite methodological differences, but extends the concept to include sex differences in correlations of subjects' encoding accuracy and extroversion.

Field Dependence-Independence

Two studies cited in the literature review utilized field dependence/independence as a correlate of encoding and decoding. Wolitzky (1973) found a significantly positive relationship between field independence and auditory decoding of affect in the Feldstein Affect Judgment Test. Shennum (1976) found a significantly positive relationship between field independence and affective facial encoding. The present study did not substantiate either of these findings whether correlations of encoding/decoding accuracy and field independence were completed for each sex separately or for both sexes combined. Field independence, as measured by the Embedded Figures Test, was not significantly correlated with encoding/decoding, but was significantly correlated with 11 of the 15 scales on the GPT which appears to be a far more complex process than encoding or decoding.

Person Perception and Affective Encoding/Decoding Accuracy

The primary thrust of this study was an attempt to demonstrate an empirical relationship between encoding/decoding of facially expressed emotions and the more complex process of person perception in live interactions.

Encoding and Person Perception. Encoding was significantly correlated with 10 of the 15 GPT scales including Accuracy and Stereotypic Accuracy (the degree to which one can predict one or more others' ratings of oneself), Empathy and Stereotypic Empathy (the degree to which one can predict how one or more others rate themselves), Interpersonal Openness

(the degree to which others can predict one's rating of them), Congruence (the degree to which one rates others as they are perceived rating oneself), Other Acceptance (the degree to which one rates others as they rate themselves), Perceived Similarity (the degree to which one rates oneself as similar to others), Perceived Concurrence (the degree to which others predict that one rates them as they rate themselves), and Conformity (the degree to which one's ratings of others conforms to the group's rating of those others).

Decoding and Person Perception. Decoding was significantly correlated with only 3 of the 15 GPT scales. Two of the GPT scales (Accuracy and Stereotypic Accuracy) overlapped with significant encoding correlations. Personal Openness (the degree to which others can predict one's self-concept/reflects self-disclosure) also correlated with decoding. These correlations suggest that while decoding skills may be somewhat universal, those who are more skilled at decoding tend to self-disclose more and to be more sensitive in reading others' cues regarding their affective states. Self-disclosure represents vulnerability and can only be adaptive if the organism can read cues well enough to discriminate when it is safe to self-disclose. Increased decoding skills, whether learned or a function of intelligence (i.e., acuity of discrimination and integration of cues) would tend to enhance one's willingness to risk self-disclosure when he or she can accurately read the responses of others and know whether or not moving toward openness and intimacy is a reasonable maneuver. It was expected that decoding would also be correlated with the GPT scales of Empathy (ability to predict another's self-concept), but these correlations were only minimal (r = .17, p = .17 for Empathy and r = .14, p = .25 for Stereotypic Empathy).

Factor Structure

Factor analyses were conducted for males, for females, and for males and females combined. The factorial structure of the data demonstrated that sex differences in encoding and decoding accuracy may be somewhat a result of qualitative differences in perceptual style but that differences in encoding and decoding accuracy are primarily quantitative. Buck et al. (1972) discuss the commonly accepted belief that in this culture males are discouraged from expressing emotions, consequently inhibiting and internalizing their feelings, while females are encouraged to express their feelings freely. Perhaps socialization regarding expression of emotions is more complex, however.

Young males are discouraged from expressing certain emotions (e.g., big boys don't cry) while at the same time allowed or encouraged to express other emotions, particularly in aggressive or competitive situations. Conversely, young females are discouraged from expressing aggressive feelings, although there is more acceptance for females to be "masculine" than for males to be "feminine" in expression of feelings. Also, young females are encouraged and reinforced for expressing feelings that relate to vulnerability or tenderness. Perhaps the young females' permission to be expressive across a broader range of feelings permits them to develop both encoding and decoding accuracy. It may be that this difference in socialization accounts for the results in the present study that found female superiority in both encoding and decoding accuracy. An alternative explanation is that there may be sex differences because of some biochemical or brain structure differences that facilitate females' superiority. The factor analyses demonstrate that sex differences

represent quantitative differences, but does not clearly suggest the etiology of these differences.

Regression Analyses

The regression analyses clearly supported the expected relationship between encoding/decoding accuracy and person perception. Whether analyses were conducted for males, for females, or for males and females combined, person perception variables were better predictors or encoding and decoding accuracy than the scales of the Eysenck Personality Inventory or the Embedded Figures Test of field independence. While encoding accuracy does appear to be a function of mental health as demonstrated in the correlation of encoding accuracy and extroversion (r = .24, p = .05), statistically the best predictors for both encoding and decoding accuracy were found in the Group Perceptions Test scales of person perception. While the importance of facial encoding and decoding accuracy has been assumed, the literature does not reflect previous demonstrations of this relationship.

Discussion

Ekman et al. (1972) and other researchers have demonstrated that decoding skills are universal across cultures. Individuals can recognize the emotions of others with a high degree of accuracy despite vast cultural differences. In the present study subjects were able to decode actors' faces with a high degree of accuracy, although there were significant sex differences. Decoding accuracy scores were essentially unrelated to personality measures, suggesting that decoding is primarily a perception task. Although there are sex differences and some individual differences,

decoding accuracy appears to be distributed fairly normally in the population.

In contrast to decoding accuracy, encoding accuracy has a higher degree of variation and is related to measures of personality, perceptual style, and person perception. It appears that encoding accuracy is more of a behavioral task in which variables such as prior experience, self-confidence, and general personality functioning play an important role. These results suggest that the individual who can encode emotions accurately is more adaptively suited to function well interpersonally.

Encoding of Internal States and Reactions to Others

Correlations of the Group Perceptions Test and encoding/decoding accuracy suggest an interesting phenomenon. Results suggest that what one encodes facially is more of an expression of reactions to others than an expression of one's internal states. Evidence to support this hypothesis exists in the positive, significant correlation of encoding accuracy and the GPT scale of Interpersonal Openness (the degree to which others can predict one's rating of them). Accurately encoding emotional reactions to others facilitates their predictions of one's view of them. Further evidence exists in the absence of a positive, significant correlation between encoding and the GPT scale of Personal Openness (the degree to which others can predict one's self-concept/reflects self-disclosure). If one accurately encodes internal states (self-disclosure), then a positive significant correlation would exist between Personal Openness and encoding accuracy, but the present study does not support that contention (r = .09, p = .46). In addition, if others accurately encode their

internal states, then a positive significant correlation would exist between one's decoding accuracy score and one's GPT empathy score (if others encode internal states and if one has high decoding accuracy, one would be empathic--able to predict others' self-concepts). Decoding accuracy and GPT Empathy were not significantly correlated (r = .17, p = .17). Still further evidence exists in the relationship of extroversion to the GPT scales and to encoding accuracy. It is logical to assume that extroverts encode more freely and accurately. This assumption is verified in the results of the study (r = .24, p = .05). However, extroversion was not significantly correlated with any of the 15 GPT scales as predicted for the above reason. If extroverts had actually encoded internal states (self-disclosed) more than introverts, then there would have been positive significant correlations between extroversion and the GPT scales that tap others' ratings of one's self-concept. Extroverts encode more freely and accurately, but do not encode internal states sufficiently for others to be able to predict the extrovert's self-concepts.

In considering this hypothesis about individuals encoding reactions to others more readily than encoding internal states, one must keep in mind that these subjects knew each other for only one hour before completing the Group Perceptions Test. Perhaps if they had met for several sessions before completing the GPT, sufficient rapport and trust would have developed to facilitate the encoding of internal states. Subjects may have disclosed more and may therefore have been more predictable by others.

This pattern of results that suggests that individuals encode reactions to others more than they encode internal states or processes relating to how they feel about themselves suggests that individuals who encode emotions freely and clearly are not necessarily very open about themselves.

An example of this is the person with the diagnostic label of psychopathic personality. The psychopath may be highly skilled at impression management in terms of encoding the emotions he or she wants to be seen as experiencing, but what is encoded is not necessarily related to the psychopath's internal states or intentions. While the accurate encoder may be more capable of self-disclosing such that others can accurately know him or her, the encoder clearly has options about how much is disclosed on the face. In this one-hour interaction, highly accurate encoders were no more predictable than less accurate encoders.

Further Studies

Results from the present study suggest several possible studies that would further elucidate relationships within encoding, decoding, and person perception. A comparison study of auditory encoding and decoding accuracy may show results parallel to facial encoding and decoding accuracy and person perception, further demonstrating that encoding is a personal process while decoding is an interpersonal process. It would be instructive to have subjects meet for several sessions in future studies to enable the researcher to determine if subjects tend to disclose more of the self and are therefore more predictable by others or if subjects can effectively inhibit expression of internal states over several sessions. Results of sex differences in encoding and decoding accuracy also suggest that it would be meaningful to examine the possibility of sex differences in person perception concepts as measured by the Group Perceptions Test.

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APPENDIX A

GROUP PERCEPTIONS TEST

Group Perceptions Test

On each of a number of areas, you are to make ratings describing: (1) how you see yourself; (2) how you see each of the other group members; (3) your prediction or guess about how each group member sees you; (4) your prediction or guess about how each group member sees him/herself. These last two tasks, predicting the others' ratings, can be rather difficult. They require you to put yourself in the other group members' shoes and imagine how you appear to them and how they see themselves. Please take your time and try your very best. This information can lead to a better understanding of how people come to know one another.

Your task is to rate the degree to which one of two adjectives, opposite in meaning, is descriptive of the person or viewpoint being rated. E.g., a sample item might be:

	Very		Moderately		Neutral		Moderately		Very	
Kind:	A	:	B	:	C	:	D	:	E	:Cruel

You might see yourself as very kind and so should mark the "A" column on the IBM card. You might see the person sitting in Chair 2 as moderately cruel and mark the "D" column for the appropriate item. If you predict that the person in Chair 3 sees you as neutral on this scale, mark the appropriate "C". All marks must be made with number 2 pencils and should be a single, dark line through the center of the "circle".

You have been provided with a card listing each group member's name and the number of the chair in which he/she was sitting. Please refer to this card so that you will know to whom each item refers. The items below describe the person for whom ratings or predictions are made only by the Chair Number. Items which refer to your own chair number have been marked out and should be skipped.

Please keep your answers confidential and discuss the test only with the experimenter. Please do not mark on this booklet. Do you have any questions?

	Very	Moderately	Neutral	Moderately	Very	
Strong:	A	B	C	D	E	:Weak

1. How strong/weak do you see yourself?
2. How strong/weak do you see the person in Chair 1?
3. How strong/weak do you see the person in Chair 2?
4. How strong/weak do you see the person in Chair 3?
5. How strong/weak do you see the person in Chair 4?
6. How strong/weak does the person in Chair 1 see you?
7. How strong/weak does the person in Chair 2 see you?
8. How strong/weak does the person in Chair 3 see you?
9. How strong/weak does the person in Chair 4 see you?
10. How strong/weak does the person in Chair 1 see him/herself?
11. How strong/weak does the person in Chair 2 see him/herself?
12. How strong/weak does the person in Chair 3 see him/herself?
13. How strong/weak does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Friendly:	A	B	C	D	E	:Hostile

14. How friendly/hostile do you see yourself?
15. How friendly/hostile do you see the person in Chair 1?
16. How friendly/hostile do you see the person in Chair 2?
17. How friendly/hostile do you see the person in Chair 3?
18. How friendly/hostile do you see the person in Chair 4?
19. How friendly/hostile does the person in Chair 1 see you?
20. How friendly/hostile does the person in Chair 2 see you?
21. How friendly/hostile does the person in Chair 3 see you?
22. How friendly/hostile does the person in Chair 4 see you?
23. How friendly/hostile does the person in Chair 1 see him/herself?
24. How friendly/hostile does the person in Chair 2 see him/herself?
25. How friendly/hostile does the person in Chair 3 see him/herself?
26. How friendly/hostile does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Passive:	A	B	C	D	E	:Active

27. How passive/active do you see yourself?
28. How passive/active do you see the person in Chair 1?
29. How passive/active do you see the person in Chair 2?
30. How passive/active do you see the person in Chair 3?
31. How passive/active do you see the person in Chair 4?
32. How passive/active does the person in Chair 1 see you?
33. How passive/active does the person in Chair 2 see you?
34. How passive/active does the person in Chair 3 see you?
35. How passive/active does the person in Chair 4 see you?
36. How passive/active does the person in Chair 1 see him/herself?
37. How passive/active does the person in Chair 2 see him/herself?
38. How passive/active does the person in Chair 3 see him/herself?
39. How passive/active does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Good:	A	B	C	D	E	:Bad

40. How good/bad do you see yourself?
41. How good/bad do you see the person in Chair 1?
42. How good/bad do you see the person in Chair 2?
43. How good/bad do you see the person in Chair 3?
44. How good/bad do you see the person in Chair 4?
45. How good/bad does the person in Chair 1 see you?
46. How good/bad does the person in Chair 2 see you?
47. How good/bad does the person in Chair 3 see you?
48. How good/bad does the person in Chair 4 see you?
49. How good/bad does the person in Chair 1 see him/herself?
50. How good/bad does the person in Chair 2 see him/herself?
51. How good/bad does the person in Chair 3 see him/herself?
52. How good/bad does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Dominant:	A	B	C	D	E	:Submissive

53. How dominant/submissive do you see yourself?
54. How dominant/submissive do you see the person in Chair 1?
55. How dominant/submissive do you see the person in Chair 2?
56. How dominant/submissive do you see the person in Chair 3?
57. How dominant/submissive do you see the person in Chair 4?
58. How dominant/submissive does the person in Chair 1 see you?
59. How dominant/submissive does the person in Chair 2 see you?
60. How dominant/submissive does the person in Chair 3 see you?
61. How dominant/submissive does the person in Chair 4 see you?
62. How dominant/submissive does the person in Chair 1 see him/herself?
63. How dominant/submissive does the person in Chair 2 see him/herself?
64. How dominant/submissive does the person in Chair 3 see him/herself?
65. How dominant/submissive does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Cold:	A	B	C	D	E	:Warm

66. How cold/warm do you see yourself?
67. How cold/warm do you see the person in Chair 1?
68. How cold/warm do you see the person in Chair 2?
69. How cold/warm do you see the person in Chair 3?
70. How cold/warm do you see the person in Chair 4?
71. How cold/warm does the person in Chair 1 see you?
72. How cold/warm does the person in Chair 2 see you?
73. How cold/warm does the person in Chair 3 see you?
74. How cold/warm does the person in Chair 4 see you?
75. How cold/warm does the person in Chair 1 see him/herself?
76. How cold/warm does the person in Chair 2 see him/herself?
77. How cold/warm does the person in Chair 3 see him/herself?
78. How cold/warm does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Impulsive:	A	B	C	D	E	:Cautious

79. How impulsive/cautious do you see yourself?
80. How impulsive/cautious do you see the person in Chair 1?
81. How impulsive/cautious do you see the person in Chair 2?
82. How impulsive/cautious do you see the person in Chair 3?
83. How impulsive/cautious do you see the person in Chair 4?
84. How impulsive/cautious does the person in Chair 1 see you?
85. How impulsive/cautious does the person in Chair 2 see you?
86. How impulsive/cautious does the person in Chair 3 see you?
87. How impulsive/cautious does the person in Chair 4 see you?
88. How impulsive/cautious does the person in Chair 1 see him/herself?
89. How impulsive/cautious does the person in Chair 2 see him/herself?
90. How impulsive/cautious does the person in Chair 3 see him/herself?
91. How impulsive/cautious does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Dull:	A	B	C	D	E	:Intelligent

92. How dull/intelligent do you see yourself?
93. How dull/intelligent do you see the person in Chair 1?
94. How dull/intelligent do you see the person in Chair 2?
95. How dull/intelligent do you see the person in Chair 3?
96. How dull/intelligent do you see the person in Chair 4?
97. How dull/intelligent does the person in Chair 1 see you?
98. How dull/intelligent does the person in Chair 2 see you?
99. How dull/intelligent does the person in Chair 3 see you?
100. How dull/intelligent does the person in Chair 4 see you?
101. How dull/intelligent does the person in Chair 1 see him/herself?
102. How dull/intelligent does the person in Chair 2 see him/herself?
103. How dull/intelligent does the person in Chair 3 see him/herself?
104. How dull/intelligent does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Homely:	A	B	C	D	E	:Attractive

105. How homely/attractive do you see yourself?
106. How homely/attractive do you see the person in Chair 1?
107. How homely/attractive do you see the person in Chair 2?
108. How homely/attractive do you see the person in Chair 3?
109. How homely/attractive do you see the person in Chair 4?
110. How homely/attractive does the person in Chair 1 see you?
111. How homely/attractive does the person in Chair 2 see you?
112. How homely/attractive does the person in Chair 3 see you?
113. How homely/attractive does the person in Chair 4 see you?
114. How homely/attractive does the person in Chair 1 see him/herself?
115. How homely/attractive does the person in Chair 2 see him/herself?
116. How homely/attractive does the person in Chair 3 see him/herself?
117. How homely/attractive does the person in Chair 4 see him/herself?

	Very	Moderately	Neutral	Moderately	Very	
Open:	A	B	C	D	E	:Closed

118. How open/closed do you see yourself?
119. How open/closed do you see the person in Chair 1?
120. How open/closed do you see the person in Chair 2?
121. How open/closed do you see the person in Chair 3?
122. How open/closed do you see the person in Chair 4?
123. How open/closed does the person in Chair 1 see you?
124. How open/closed does the person in Chair 2 see you?
125. How open/closed does the person in Chair 3 see you?
126. How open/closed does the person in Chair 4 see you?
127. How open/closed does the person in Chair 1 see him/herself?
128. How open/closed does the person in Chair 2 see him/herself?
129. How open/closed does the person in Chair 3 see him/herself?
130. How open/closed does the person in Chair 4 see him/herself?

APPENDIX B

MISCELLANEOUS DATA

TABLE XIV

STEPWISE REGRESSION FOR PREDICTING
DECODING AND ENCODING BY SEX

Variables	B Value	F	p
Females Decoding			
Intercept	82.272		
GPT Personal Openness	-6.101	4.27	.04
GPT Commonality	8.077	13.09	<.01
GPT Conformity	-8.184	19.22	<.01
EPI Extroversion	0.856	12.42	<.01
Variance Accounted for: 0.553			
Females Encoding			
Intercept	-17.015		
GPT Perceived Similarity	6.891	4.03	.05
EPI Extroversion	1.567	11.42	<.01
EPI Neuroticism	-0.762	5.06	.03
EPI Lie	3.394	6.87	.01
Variance Accounted for: 0.439			
Males Decoding			
Intercept	4.641		
GPT Stereotypic Empathy	4.457	3.66	.06
GPT Personal Openness	11.959	14.80	<.01
GPT Felt Openness	-7.222	5.50	.02
EPI Extroversion	-0.734	4.90	.03
Variance Accounted for: 0.470			
Males Encoding			
Intercept	114.069		
GPT Stereotypic Empathy	8.427	5.25	.02
GPT Congruence	19.182	20.66	<.01
EFT Field Dependence-Independence	0.017	6.65	.01
Variance Accounted for: 0.593			

TABLE XV

VARI-MAX ROTATED FACTOR LOADINGS FOR BOTH SEXES

Variable	F 1	F 2	F 3	F 4	F 5	F 6
GPT						
Accuracy	.24	.14	.87	-.05	.17	-.11
Stereotypic Accuracy	.31	.05	.79	-.09	.19	-.18
Empathy	.69	.47	.17	-.20	.13	-.20
Stereotypic Empathy	.67	.38	.13	-.09	.18	-.33
Congruence	.72	-.24	.21	.10	.01	.02
Interpersonal Openness	.81	.28	-.06	.01	.08	-.06
Personal Openness	-.20	.46	.54	.09	.29	.03
Felt Openness	.01	.81	.24	-.11	-.03	.04
Perceived Realism	-.12	.78	.19	.25	.12	-.10
Perceived Similarity	.74	-.30	.10	-.18	-.12	.12
Commonality	.33	.82	-.03	-.08	.10	.13
Other Acceptance	.63	.46	.38	.26	.04	.05
Concurrence	.21	.23	.84	.10	-.02	-.01
Perceived Concurrence	.64	.50	.43	.12	-.04	.06
Conformity	.70	.06	.41	.23	-.12	.01
EPI						
Extroversion	.02	.14	-.09	.76	.29	-.05
Neuroticism	-.09	.01	-.11	.01	.05	.85
Lie	-.04	.16	-.09	-.75	.20	-.07
EFT						
Field Dependence	-.14	-.51	-.15	.11	.18	.34
Decoding	-.03	.05	.26	-.01	.76	.15
Encoding	.46	-.03	.07	.16	.51	-.35
Variance Accounted for:	4.61	3.65	3.25	1.53	1.28	1.27

TABLE XVI

INTERCORRELATIONS OF DECODING EIGHT EMOTIONS
AND TOTAL DECODING ACCURACY

	DELA	DJOY	DCON	DRES	DGRI	DSHO	DFEA	DANG	DTOT	
DELA										r
										p
DJOY	.38									r
	<.01									p
DCON	.10	.22								r
	.40	.07								p
DRES	.34	.22	.27							r
	<.01	.07	.02							p
DGRI	.02	-.15	-.08	.01						r
	.86	.23	.50	.89						p
DSHO	-.17	.02	-.16	.07	.08					r
	.16	.84	.18	.54	.51					p
DFEA	.03	-.01	-.06	.11	.14	-.00				r
	.80	.87	.61	.36	.26	.94				p
DANG	-.18	-.12	-.06	.01	.35	.02	.05			r
	.13	.32	.60	.91	<.01	.84	.66			p
DTOT	.57	.49	.08	.41	.08	-.17	.05	.13		r
	<.01	<.01	.52	<.01	.52	.17	.70	.27		p

TABLE XVII

INTERCORRELATIONS OF ENCODING EIGHT EMOTIONS
AND TOTAL ENCODING ACCURACY

	EELA	EJOY	ECON	ERES	EGRI	ESHO	EFEA	EANG	ETOT	
EELA										r
										p
EJOY	.02									r
	.83									p
ECON	.06	.24								r
	.61	.05								p
ERES	-.00	.19	.03							r
	.94	.11	.78							p
EGRI	-.03	-.02	-.16	.06						r
	.78	.86	.19	.62						p
ESHO	.41	-.26	.11	-.02	.02					r
	<.01	.03	.35	.84	.86					p
EFEA	.28	-.25	.09	.13	.08	.40				r
	.02	.04	.45	.28	.51	<.01				p
EANG	-.05	.00	.01	.00	.02	.31	-.03			r
	.67	.99	.90	.99	.87	.01	.79			p
ETOT	.21	-.00	.23	.07	.01	.39	.13	.10		r
	.09	.94	.06	.55	.92	<.01	.29	.39		p

TABLE XVIII

INTERCORRELATIONS OF ENCODING AND DECODING EIGHT EMOTIONS
AND TOTAL ENCODING AND DECODING ACCURACY

	EELA	EJOY	ECON	ERES	EFRI	ESHO	EFEA	EANG	ETOT
DELA	.15	.22	.20	.00	-.25	-.02	.07	.06	.12
	.22	.07	.10	.98	.04	.84	.54	.60	.34
DJOY	.01	.09	-.02	.17	-.01	.00	.03	.11	.12
	.91	.45	.83	.17	.92	.95	.80	.38	.33
DCON	.19	-.02	.08	-.07	-.25	.18	.11	.15	.12
	.12	.81	.49	.56	.04	.13	.37	.20	.34
DRES	.06	-.00	-.07	-.03	-.21	.14	.01	.19	.03
	.60	.95	.53	.76	.08	.25	.88	.11	.80
DGRI	.04	-.12	-.07	-.09	.08	-.02	-.08	-.12	-.10
	.71	.31	.53	.46	.49	.81	.52	.32	.39
DSHO	-.11	-.06	.00	-.14	.01	-.11	-.00	-.04	-.14
	.38	.58	.97	.26	.88	.37	.99	.72	.25
DFEA	-.07	.00	.07	.06	.13	.15	.05	.42	.25
	.57	.99	.57	.60	.29	.20	.68	<.01	.04
DANG	-.14	.17	.05	.00	.00	-.20	-.23	-.03	-.10
	.24	.17	.66	.94	.94	.10	.05	.80	.40
DTOT	.06	.08	.08	-.02	-.16	.07	.03	.26	.12
	.59	.51	.50	.87	.17	.57	.80	.03	.32

TABLE XIX

INTERCORRELATION OF ALL DATA

	AC	STAC	EM	STEM	IO	PO	FO	PR	PS	CM	OA	CN	PC	CF	CG	
AC	1.00	0.87	0.46	0.43	0.20	0.49	0.33	0.28	0.25	0.20	0.53	0.77	0.55	0.45	0.31	r
	0.00	<0.01	<0.01	<0.01	0.10	<0.01	<0.01	0.02	0.04	0.09	<0.01	<0.01	<0.01	<0.01	0.01	p
STAC		1.00	0.47	0.43	0.22	0.30	0.18	0.19	0.26	0.18	0.51	0.67	0.51	0.42	0.37	r
		0.00	<0.01	<0.01	0.07	0.01	0.15	0.11	0.03	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	p
EM			1.00	0.87	0.68	0.14	0.38	0.23	0.39	0.57	0.63	0.39	0.73	0.53	0.29	r
			0.00	<0.01	<0.01	0.24	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	p
STEM				1.00	0.63	0.16	0.28	0.21	0.40	0.49	0.58	0.33	0.61	0.47	0.33	r
				0.00	<0.01	0.18	0.02	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	p
IO					1.00	0.03	0.21	0.16	0.48	0.45	0.65	0.24	0.58	0.51	0.46	r
					0.00	0.79	0.09	0.20	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	p
PO						1.00	0.51	0.53	-0.23	0.25	0.33	0.48	0.31	0.16	-0.07	r
						0.00	<0.01	<0.01	0.05	0.04	<0.01	<0.01	0.01	0.19	0.53	p
FO							1.00	0.70	-0.05	0.65	0.37	0.36	0.50	0.12	-0.05	r
							0.00	<0.01	0.67	<0.01	<0.01	<0.01	<0.01	0.31	0.68	p
PR								1.00	-0.27	0.56	0.42	0.30	0.37	0.05	-0.10	r
								0.00	0.02	<0.01	<0.01	0.01	<0.01	0.67	0.42	p
PS									1.00	-0.00	0.27	0.13	0.31	0.47	0.60	r
									0.00	0.95	0.02	0.27	0.01	<0.01	<0.01	p
CM										1.00	0.60	0.17	0.57	0.22	0.05	r
										0.00	<0.01	0.15	<0.01	0.07	0.65	p
OA											1.00	0.58	0.87	0.63	0.44	r
											0.00	<0.01	<0.01	<0.01	<0.01	p
CN												1.00	0.65	0.54	0.17	r
												0.00	<0.01	<0.01	0.15	p
PC													1.00	0.70	0.41	r
													0.00	<0.01	<0.01	p
CF														1.00	0.58	r
														0.00	0.01	p
CG															1.00	r
															0.00	p

TABLE XIX (Continued)

	ENC Males	ENC Females	ENC Total	DEC Males	DEC Females	DEC Total	EFT	EPI E	EPI N	EPI L	
AC	0.25	0.28	0.29	0.22	0.25	0.28	-0.24	0.00	-0.17	-0.00	r
	0.03	0.02	0.01	0.07	0.04	0.02	0.04	0.98	0.16	0.94	p
STAC	0.26	0.33	0.32	0.22	0.23	0.27	-0.28	0.00	-0.20	0.03	r
	0.03	<0.01	<0.01	0.07	0.05	0.02	0.02	0.99	0.10	0.76	p
EM	0.32	0.28	0.33	0.04	0.21	0.17	-0.47	0.00	-0.21	0.15	r
	<0.01	0.02	<0.01	0.70	0.09	0.17	<0.01	0.98	0.08	0.22	p
STEM	0.36	0.38	0.40	0.04	0.17	0.14	-0.43	0.06	-0.28	0.03	r
	<0.01	<0.01	<0.01	0.70	0.17	0.25	<0.01	0.60	0.02	0.76	p
IO	0.43	0.38	0.43	-0.07	0.05	-0.00	-0.18	0.03	-0.15	-0.00	r
	<0.01	<0.01	<0.01	0.55	0.69	0.97	0.15	0.80	0.22	0.99	p
PO	0.09	0.07	0.09	0.26	0.24	0.30	-0.13	0.13	-0.03	0.07	r
	0.44	0.56	0.46	0.03	0.05	0.01	0.29	0.27	0.78	0.54	p
FO	0.06	-0.04	0.01	0.00	0.06	0.05	-0.29	0.00	-0.03	0.19	r
	0.60	0.71	0.91	0.99	0.58	0.68	0.01	0.98	0.77	0.12	p
PR	0.14	0.04	0.11	0.16	0.09	0.15	-0.28	0.21	-0.11	-0.06	r
	0.23	0.70	0.35	0.18	0.44	0.21	0.02	0.08	0.37	0.62	p
PS	0.32	0.23	0.29	-0.15	-0.01	-0.09	0.03	-0.18	-0.24	-0.00	r
	<0.01	0.05	0.01	0.20	0.91	0.45	0.81	0.15	0.05	0.95	p
CM	0.10	0.00	0.07	0.12	0.13	0.16	-0.38	0.08	0.03	0.15	r
	0.39	0.99	0.54	0.31	0.28	0.20	<0.01	0.51	0.79	0.23	p
OA	0.34	0.26	0.32	0.08	0.15	0.14	-0.29	0.21	-0.11	-0.15	r
	<0.01	0.03	<0.01	0.52	0.22	0.24	0.01	0.09	0.38	0.20	p
CN	0.23	0.21	0.23	0.09	0.19	0.18	-0.28	0.05	-0.10	-0.08	r
	0.05	0.08	0.06	0.44	0.11	0.14	0.02	0.65	0.42	0.49	p
PC	0.29	0.24	0.29	-0.00	0.15	0.09	-0.36	0.15	-0.08	-0.05	r
	0.01	0.04	0.01	0.95	0.22	0.43	<0.01	0.23	0.49	0.69	p
CF	0.34	0.33	0.35	-0.03	0.05	0.01	-0.26	0.15	-0.10	-0.16	r
	<0.01	<0.01	<0.01	0.77	0.68	0.92	0.03	0.22	0.39	0.20	p
CG	0.30	0.34	0.34	0.02	0.02	0.02	0.01	0.02	-0.15	-0.11	r
	0.01	<0.01	<0.01	0.86	0.83	0.84	0.89	0.81	0.23	0.38	p

TABLE XIX (Continued)

	ENC Males	ENC Females	ENC Total	DEC Males	DEC Females	DEC Total	EFT	EPI E	EPI N	EPI L	
ENC Males	1.00	0.78	0.93	-0.04	0.15	0.07	-0.08	0.16	-0.09	0.11	r
	0.00	0.01	0.01	0.69	0.21	0.53	0.50	0.18	0.44	0.36	p
ENC Females		1.00	0.93	0.02	0.18	0.13	-0.05	0.26	-0.19	0.07	r
		0.00	0.01	0.85	0.13	0.27	0.68	0.03	0.11	0.55	p
ENC Total			1.00	-0.01	0.19	0.12	-0.06	0.24	-0.19	0.07	r
			0.00	0.91	0.12	0.32	0.58	0.05	0.12	0.56	p
DEC Males				1.00	0.38	0.78	0.05	0.15	0.10	-0.17	r
				0.00	0.01	0.01	0.64	0.21	0.41	0.16	p
DEC Females					1.00	0.87	-0.03	0.00	-0.04	0.06	r
					0.00	0.01	0.77	0.94	0.74	0.61	p
DEC Total						1.00	0.00	0.08	0.02	-0.04	r
						0.00	0.94	0.49	0.81	0.69	p
EFT							1.00	-0.02	0.13	-0.12	r
							0.00	0.83	0.30	0.32	p
EPI E								1.00	0.07	-0.27	r
								0.00	0.56	0.03	p
EPI N									1.00	-0.01	r
									0.00	0.92	p
EPI L										1.00	r
										0.00	p

VITA

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