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Self-esteem, defensiveness, and psychophysiological reactions during self-disclosure.

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SELF-ESTEEM, DEFENSIVENESS, AND PSYCHOPHYSIOLOGICAL
REACTIONS DURING SELF-DISCLOSURE

A Dissertation Presented

By

ROBERT BRUCE ALEXANDER

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

February 1980

Psychology



Robert Bruce Alexander

1980

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SELF-ESTEEM, DEFENSIVENESS, AND PSYCHOPHYSIOLOGICAL
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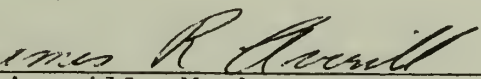
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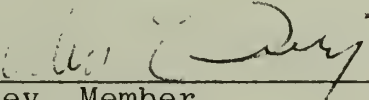
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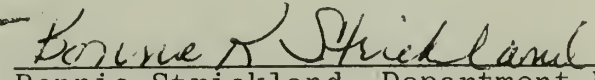
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This paper is dedicated to my wife and
sons, who were quite patient with me,
and to Seymour Epstein, whose theory
stimulated this research.

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Three students assisted by collecting part of

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ABSTRACT

Self-Esteem, Defensiveness, and Psychophysiological Reactions During Self-Disclosure

(February 1980)

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Directed by: Professor Seymour Epstein

Both psychoanalytic theory and phenomenological self-theory predict stress as a function of unfavorable self-evaluation and as a function of concealing defenses. This process is easier to observe clinically than to measure objectively. One procedure, explored by this experiment, is to study the psychophysiological reactions of subjects during self-disclosure via personality inventory. This situation places many subjects in the bind of either disclosing unfavorable self-concepts or being deceptive. Defensive misrepresentation of self-esteem is a problem which has rarely been studied. This experiment used lie detection techniques to study the validity of self-esteem reports. Of special interest are group differences between subjects selected according to level of self-esteem and defensiveness.

Four hundred subjects were tested in groups using

the O'Brien and Epstein self-esteem scale (1975) and, as a measure of defensiveness, the Crowne and Marlowe social desirability response-bias scale (1960). From this population, 30 male and 30 female subjects were selected for further study. There were 10 subjects in each of six cells determined by three levels of self-esteem and two levels of defensiveness. These subjects were presented with 20 self-disclosing personality items at the rate of one every 28.5 seconds, while skin conductance, response latency, heart rate and eyeblinks were recorded. Subjects rated their degree of agreement or disagreement with each item by pushing a button. The items were half self-esteem and half defensive in content, and half favorable and half unfavorable. Favorable self-evaluations in response to defensiveness items were defined as probable deceptive responses, for the defensiveness items consist of socially desirable, yet highly unlikely, self-attributes.

Analysis of the results revealed reliable effects attributable to the type of items presented. Unfavorable items were associated with longer response latencies and more skin conductance responses than favorable items. This was a stronger effect for the self-esteem items than defensiveness items. Level of self-esteem was a significant factor. Subjects of average self-esteem produced equivalent responses to favorable and unfavorable self-esteem items,

while subjects of low self-esteem and subjects of high self-esteem both produced more skin conductance responses to unfavorable than favorable self-esteem items. These results indicate that skin conductance responses and, to a lesser extent, response latency, are reliable indicators of stress in this situation.

When the data were analyzed by the favorability of the self-evaluations made by the subjects, it was found that most subjects produced longer response latency and more skin conductance responses during unfavorable than during favorable self-evaluation in response to the self-esteem items. This effect is attributable to the stress of unfavorable self-evaluation.

The pattern of reactions to the defensiveness items was much different. For these items, favorable self-evaluations produced more skin conductance responses than unfavorable self-evaluations. This effect is attributable to the stress of defensive misrepresentation and associated intrapsychic conflict.

Subjects high on the defensiveness scale, or very high on the self-esteem scale, produced more skin conductance responses when reporting favorable self-esteem than when reporting unfavorable self-esteem. This pattern of reactions, the same as to the defensiveness items, indicates stress suggestive of deception during reports of high

self-esteem. The findings suggest that subjects who receive very high self-esteem scores, whether or not they also receive high defensiveness scores, have presented a false picture of themselves.

The items presented, typical of many personality questionnaire items, produced indications of mild psychological stress in all groups. Part of the stress could be attributed to unfavorable self-evaluations and part could be attributed to the concealing defenses of denial and repression. Thus the results support the hypothesis that self-disclosure is influenced by a need to enhance self-esteem and a need to maintain a consistent and valid self-theory.

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CHAPTER I

INTRODUCTION

The lie in its mere form is man's crime against his own nature, and is one which must make a man disreputable in his own eyes.

Immanuel Kant

Deception in an interview or on a personality questionnaire is a problem basic to psychology. The practicing psychologist, be he or she a researcher, administrator or therapist, must continually make judgments concerning the accuracy and insight of the subject. People tend to present themselves in a socially acceptable manner, which can often be a motivation contrary to accurate self-disclosure.

This problem is especially true when people are asked to present themselves on questionnaires concerning general self-attitudes rather than specific and more verifiable attributes. When a subject presents himself or herself as having high self-esteem on a questionnaire, is the psychologist to accept that self-assessment, or suspect the involvement of a denial of imperfections? This question has been partly met by scales of deceptiveness and/or social desirability response-bias, but, as will be discussed later,

questions concerning the validity of such scales remain to be answered. The present study attempts to determine the validity of reported self-esteem using psychophysiological lie detection techniques.

The thesis of this dissertation is that self-disclosure is influenced by two basic motivations: a desire to enhance self-esteem by presenting a favorable image, and a desire to maintain a consistent and valid self-theory. These motives often come into conflict during self-disclosure. It is hypothesized that a threat to either of these basic motivations is stressful, and that the stress can be measured as autonomic arousal during self-disclosure via personality inventory. The act of revealing unfavorable self-evaluations and the act of defensive concealment are both expected to be stressful.

Of special interest is the grouping of subjects pre-selected by level of self-esteem (O'Brien and Epstein, 1975) and by level of defensiveness, defined as social desirability response-bias (Crowne and Marlowe, 1960). The independent variables studied include whether the test items are favorable or unfavorable, whether they are indicative of self-esteem or defensiveness, and what the subject's ratings of agreement with the items are.

A preliminary study conducted by this author found that the act of disclosing feelings of low self-esteem

was associated with physiological arousal. Another finding was that physiological arousal to unfavorable items was pronounced for some subjects who reported high self-esteem, suggesting that stress was associated with the use of concealing defenses. This finding suggests that test defensiveness is an important moderating variable, which is why self-esteem and defensive response-bias are both studied in this experiment.

The pilot study and the present study will be described in more detail following a discussion of theoretical positions.

Theoretical Considerations Concerning Self-Disclosure

The ability to symbolize, evaluate and communicate experience may be called the essence of being human. We form relatively stable concepts concerning the world around us, the people we deal with, and ourselves. Our social world is rife with evaluations. One's physical self, behaviors, and opinions are all evaluated as good or bad by others and also by one's self. The internalized set of evaluations concerning the self, an important aspect of the self-concept, has been a major concern of psychology since its formation as an academic field.

James (1892) wrote of multiple roles and aspects of the self, including the self as knower and the self as the

object known. All that a person calls part of his or her self has some emotional significance, including one's body, possessions, social relationships, values, and aspirations. Generalized self-appreciation and self-dissatisfaction are feelings aroused by evaluation of any aspect considered important to the self.

James considered social-seeking, the desire to impress others, to be instinctive rather than logical. People are concerned about the opinions of others when the realistic importance of that person is nil. Also, people will present a different social-self to different people. The division of the man into several selves may be a discordant splitting in which the man fears letting one set of people know what he is like in another situation, or it may be a 'harmonious division of labor' when he acts different roles with no conflict of values.

Intrapsychic conflict has been a major concern of clinical psychologists. Freud (1926) explained a major part of personality dynamics as a conflict between pleasurable desires (including aggression) and an evaluative superego. The superego, as the mental representative of parental rewards and punishments, serves to guide the person to conform with the internalized expectations of society. Freud concluded from his clinical experience with hysteria that sexual and hostile impulses are often denied or even

repressed from consciousness by extreme anxiety concerning negative self-evaluation. The verbal report of a client does not always conform with observed emotional responses. Freud postulated the existence of unconscious thought processes that defend against conscious knowledge regarding repressed information. He described several defenses people use to avoid self-criticism. Chief among these are denial and repression.

Denial and similar defenses such as rationalization are defenses used when the person is conscious (to some degree) of that which is being concealed. Repression is a defense that occurs without awareness. Deception at either a conscious or an unconscious level is presumed to require the expenditure of psychic energy. Freud concluded from his clinical observations that the concealing defenses guarded against libidinal and death wishes that were unacceptable to express.

Neo-Freudians have in general reduced the significance assigned to libidinal energy and have assigned self-esteem the most dynamic role. Adler (1917) stressed the role of the perception of inferiority and a compensatory striving for superiority. Horney (1937) stressed the need for security and self-esteem. She defined as neurotic the style of striving for unrealistic perfection. She perceived some people as 'self-alienated', meaning that they are

unaware of their true selves. In a similar manner, Sullivan (1953) believed that people divide their self-systems into a "not me" as well as a "good-me" and a "bad-me".

Some psychologists have based their theories of personality on the postulate that there is a striving for one's self-concepts to be consistent. Lecky (1945) considered the protection of the unity of one's conceptual system to be a fundamental human need. He wrote that individuals construct personal theories of life by the same method as would a theoretical scientist. In order for an idea to be immediately assimilated, it must be felt to be consistent with the ideas already present in the system. Ideas which are inconsistent with the individual's conception of himself are rejected. Lecky considered the perception of inconsistency to provoke internal conflict and a compulsion to unify and harmonize the self-system.

Combs and Snygg (1949, 1959) have also stressed the consistency of the 'phenomenal self'. They noted that persons who undeservedly regard themselves as incompetent or stupid will continue to maintain that belief and resist a change in self-conception contrary to evidence. Change in self-conception occurs slowly, for stability and internal consistency are actual needs. Consistency is also maintained because people perceive their experiences in ways that are consistent with their concepts of self. The

authors pointed out the "need of each of us to maintain and enhance the phenomenal self. Under threat, then, we have no choice but to defend our self-concepts when they seem to be severely threatened" (1959).

Festinger (1957) proposed a theory of cognitive dissonance which also stressed the role of selective perception in preserving a unified cognitive structure. His original formulation was of a conflict between any dissonant concepts. Later revisions of the theory (Wicklund and Brehm, 1976, Greenwald and Ronis, 1978) have modified this general statement to the more specific situation of a person feeling personally responsible for the inconsistent cognitions. It may be that self-esteem and its defense are major factors in cognitive dissonance studies.

The phenomenological view is shared by Rogers (1951, 1959), who developed his client centered therapy to allow a person with a maladaptive self-concept to gain insight in a non-threatening and supportive relationship. Self-disclosure and a tendency toward self-enhancement are expected to promote beneficial change. Rogers considers the acceptance of previously denied aspects of one's self to be enhancing and the essence of therapy. Of course the converse of this concept is that denial of perceivable aspects of the self is disturbing.

The reason that self-deception is often disturbing

deserves closer scrutiny. One way to look at this is to consider the conceptual system as a way to adapt to one's environment. This function was stressed by Kelly (1955), who perceived people as organizing their knowledge in a hierarchical structure of personal constructs. He described similarities between scientific and personal conceptualizing. Kelly, following Lecky, noted that people develop conceptual systems to enable them to predict events. One needs a valid concept of reality in order to function adequately. It follows that a denial of the reality one has learned invalidates the personal constructs and reduces capacity for adaptive behavior.

Kelly explains repression as a 'suspension' of whole categories of constructs from the total system because the person cannot tolerate a constructual system in which the idea would have meaning. If such a constructual system is considered, the suspended (usually threatening) idea may again become available. This suggests that during a clinical interview or while presenting oneself via questionnaire, the questions that are asked sometimes transmit constructs which make a person aware of usually ignored self-evaluations.

The view that the self-concept functions as a theory has been further developed by Epstein (1975, 1976). Epstein's self-theory, while incorporating aspects of ego

psychology and phenomenology, expresses the dynamics of the self-concept as being similar to a scientific theory in that data are generalized into expectations which predict the outcome of behavior in a situation. This self-theory is both explicit (verbal) and implicit (inferred from emotions). The basic functions of the self-theory are postulated to be

(1) to maintain a favorable pleasure/pain balance over the foreseeable future, (2) to assimilate the data of significant experience, and (3) to maintain self-esteem. . . . To the extent that an implicit self-theory is unable to fulfill its functions, stress is placed on the organization of the theory. This stress is experienced subjectively as unpleasant arousal, or anxiety, and there is a tendency for disorganization to occur. . . . There are three basic sources of anxiety, consisting of threats to life or limb, threats to the assimilative capacity of an individual's conceptual system, and threats to self-esteem. (Epstein, 1976)

An interesting parallel with Freud's structural theory can be made if one considers that these three basic sources of anxiety can also be described as threats to id, ego, and superego.

Epstein considers enhancement of self-esteem and maintaining a conceptual system for assimilating the data of experience to be two separate needs, both of which must be considered in predicting behavior. They may be in conflict, as when unrealistically high self-esteem is maintained by insulating the appraisal from the test of reality. But then broad generalizations such as self-esteem are com-

monly removed from the immediate test of experience and are therefore not easily invalidated.

Of importance is Epstein's assertion (1979) that sudden decreases in self-esteem are particularly aversive, which may explain why some people tend to maintain an unrealistically low level of self-esteem. Low self-esteem subjects may find favorable self-attitudes distressing, not only because this value is inconsistent with their general set, but also because a favorable self-attitude increases the likelihood that the person will experience a subsequent decrease in self-esteem.

Because people base their behavior on predictions generated by their self-theory, it must predict accurately to be useful. For this reason, people need to assimilate important experiences into a consistent and valid conceptual system that accurately represents their experiences.

Deception can be described as behavior in which significant experiences are denied expression. Of course we must differentiate between the verbal and the emotional aspects of the self-theory. The conflict can be conscious, as when deceiving others (lying) which, as will be noted later, is apt to produce physiological responses. It is also possible for a person to lack conscious awareness of a potentially disturbing conflict, as the psychodynamic concept of repression indicates. In either case, we can infer

from an anxiety response that, at some level, conflict is operating during deception.

The major hypothesis to be tested in this study is that subjects who evidence a defensive response-bias when rating personality questionnaires feel anxiety at some level (conscious or unconscious) when responding, because their responses are inconsistent with the truth about themselves of which they are at least dimly aware. Such an inference is obviously not easy to prove.

Clinical observations of deception or repression require intensive analysis of subjects before one can infer that verbal responses are inconsistent with the truth about themselves that they experience at some level. Because of this difficulty, experimental support for the clinical observation of concealing defenses is rare. This study attempts to address the problem using the approach of self-presentation via personality inventories.

Deceptiveness During Self-Disclosure Via Questionnaire

One situation in which the desire to maintain self-esteem and the desire to maintain cognitive integrity can come into conflict is that of answering personality questionnaires. This situation produces defensive reactions on the part of many people. Subjects evaluating themselves often have the unpleasant prospect of losing self-esteem

or the esteem of others if the questions are answered truthfully. Nearly all of the items in such tests have socially desirable connotations. Subjects desiring to look good to the experimenter (or to themselves) can easily alter their self-reports to improve their image. Some subjects are insightful and honest in their self-disclosures, while others defensively deny or distort the truth toward socially desirable responses.

In order to detect defensive response-bias several scales have been developed, including the Minnesota Multiphasic Personality Inventory (Hathaway and McKinley, 1943) scales of L and F, and the MMPI subscale termed 'denial' by Little and Fisher (1958). Edwards (1957) rated MMPI items for social desirability, and later claimed (1961) that these items as a scale could successfully predict most MMPI scales. However, a major problem with the Edwards social desirability scale concerns its inclusion of items measuring psychopathology, especially manifest anxiety. Crowne and Marlowe (1960) constructed a scale of social desirability response-bias that is both independent of psychopathology and controls for acquiescence-bias. It has been widely accepted as a measure of response-bias associated with social desirability. The self-esteem inventory developed by O'Brien and Epstein (1975) also includes a scale of defensive denial similar to the Crowne and Marlowe

scale, but with a five-choice scale of agreement instead of a true-false format.

Of these scales of defensive response-bias, the Crowne and Marlowe social desirability scale has been studied the most extensively, and has been validated in a number of experiments. Crowne and Marlowe (1964) address the question of whether this scale is one of conscious and deliberate misrepresentation, or of a less conscious, defensive self-evaluation. They conclude that the data are not definitive, but suggest the latter.

That a response-bias can be present without the subject's awareness has been demonstrated in several experiments. Crowne and Strickland (1961) attempted to subtly condition subjects during an interview using headshakes or nods, combined with disapproving or approving subverbal interjections, to negatively or positively reinforce the use of plural nouns. Approximately 11% of the subjects reported awareness of the manipulation. Subjects who did not report awareness of the manipulation were divided into low or high groups on the basis of their Marlowe-Crowne scores. It was found that the manipulations produced no consistent effect upon the verbal behavior of subjects low on the Marlowe-Crowne scale. Both the positive and negative reinforcement conditions were effective in influencing the verbal behavior

of subjects high on the Marlowe-Crowne scale. This response-bias was objectively observable but not reported by the subjects. The authors attribute the effect to differential need for approval, mediated at a level of awareness below that which the subject was capable of verbalizing. In another study, Strickland and Crowne (1963) found that subjects high on the Marlowe-Crowne scale tend to terminate therapy politely but prematurely, and attributed this effect to their protecting and maintaining a vulnerable self-image by avoiding anticipated threats to self-esteem.

One study that supports this view was reported by Schneider and Turkat (1974). They selected subjects by the Rosenberg self-esteem scales (1965) and the Marlowe-Crowne social desirability scale (1960). They studied young men whose scores indicated high self-esteem in an experiment in which they were presented with unfavorable information about themselves. Schneider and Turkat found that high defensive, high self-esteem subjects later presented themselves more positively, which seems to indicate a higher need for interpersonal approval for them than for subjects with low defensive, high self-esteem.

These studies suggest that subjects scoring high on the Crowne and Marlowe scale have vulnerable self-esteem and are defending against perceived threats. Thus these subjects are expected to feel anxious when confronted with

unfavorable statements regarding themselves that have some degree of validity, even if the subjects deny these shortcomings.

The inferred state of anxiety caused by either a threat to self-esteem or a threat to conceptual integrity, might also be expected to be evidenced with psychophysiological measures. The present experiment is designed to test the hypothesis that deceptive responses and expressions of low self-esteem are both accompanied by anxiety and its physiological indicants.

Psychophysiological Measurement During Self-Disclosure

At this point it is necessary to support the use of physiological measures to detect anxiety and deception. The most obvious support is its use in police work. Lie detection using a standardized questioning procedure and the monitoring of palmar sweat, heartrate and muscle tension (and sometimes respiration and voice quality) is an acceptable procedure of police interrogation in many states, although it is not admissable as proof of guilt. Larson (1932) wrote a booklet on the use of several of these measures for the detection of deception.

The procedure considered most valid is the control question technique, which detects guilty knowledge by comparing the responses to test questions with that to con-

trol questions. Raskin (1975) reported that psychophysiological measures can reliably discriminate deception even among psychopathic prisoners in a test involving the concealment of a 'stolen' \$20 bill. Other than inconclusive classifications, 96% of the prisoners were correctly classified as being guilty or innocent by a combination of 10 measures. All the psychophysiological measures discriminated significantly, especially skin conductance responses.

Similar techniques are also used in other countries. The Russian psychologist Luria (1932) wrote of the use of reaction time and muscle tension to detect lies during the interrogation of criminals. Most of our states require strict procedures to be followed to safeguard the informant's constitutional protection against forced self-incrimination. However, psychophysiological lie detection techniques are coming into wide use in the business world, which regrettably allows the subject less procedural protection.

Psychophysiological methods have also been used to determine guilt in less technological cultures. One example (Wright, 1957) is of an African shaman who detected deception in a rape trial by having several suspects chew manioc, then spit it out. The guilty one was not able to salivate enough to wet his mouthful. A similar procedure has been reported in other cultures and is based on the medically

confirmed (e.g., Pavlov, 1926) reduction of saliva during periods of high sympathetic arousal. Other less likely test situations have included combat, poison and walking over hot coals, perhaps under the assumption that conceptual integrity facilitates bodily strength and self-control.

The field of psychology has made use of more readily quantifiable psychophysiological measures for many years. Jung (1904) used the measures of response latency and skin resistance to study reactions during word-association tests. He found that the presence of emotional 'complexes' was indicated by delayed responses to key words.

In a study of deception, Marston (1920) had subjects respond with word associations or mathematical answers to stimuli that were presented on index cards. There were two lists on each card. Subjects were asked to deceive the experimenter on half of the trials by reversing the instructions and associating to the wrong list. Marston found that most subjects took longer to make deceptive responses, but that some subjects, characterized as 'good liars', were quicker to respond when being deceptive than when being truthful.

Although psychophysiological measures have a history of significant findings, several problems should be addressed concerning the use of these measures. One is that people differ as to their mean level of physiological acti-

vity (e.g., Kuno, 1956). If for a given stimulus one subject has a faster heartrate or greater skin conductance than another subject, these data are meaningless unless this response is expressed relative to the subject's usual level of physiological activity. For this reason, repeated measures of each subject are desirable, as in the 'ipsative' approach promoted by Opton and Lazarus (1967).

Another problem with the use of physiological measure to infer psychological states is that it is difficult to discriminate among different emotions. Sympathetic arousal is associated more with the intensity than the quality of emotions. Some psychologists have claimed that emotional intensity is the only dimension that can be distinguished physiologically (e.g., Cannon, 1929; Duffy, 1962). Other researchers have reported reliable physiological differences between different emotional states (e.g., Ax, 1953; Averill and Opton, 1968). Most studies consider physiological arousal to indicate anxiety, yet pleasant mental images have been found to produce arousal similar to unpleasant images (Haney and Euse, 1976). A term preferred by some (e.g., Flanagan, 1967) is that of attention, to conform with research on the orienting response (e.g., Sokolov, 1963). For practical purposes, measures of arousal can detect emotional intensity, but emotional

quality can only be experienced by participant observers, or inferred from an analysis of the situation.

The study of stress and anxiety using psychophysiological measures has often been quite revealing. An important reason for their usefulness may be that people learn to modify overt behavior, such as facial expressions, but rarely modify covert behavior such as heartrate or palmar sweating.

One field of study in which psychophysiological indicants of anxiety and defensiveness have proved useful has been that of sport parachuting. Fenz and Epstein (1967) found that novice sport parachutists exhibit monotonic gradients of physiological arousal as stimuli are presented that are increasingly relevant to a jump. Experienced parachutists exhibited a pattern of increasing, then decreasing, arousal, which was attributed to defenses against anxiety. Epstein and Fenz (1967) also performed an experiment using subjects who had been selected as to defensive style using 30 items condensed from Byrne's (1964) Repression-Sensitization Scale. They were presented with stimulus words in both a perceptual threshold task and a word-association task, while skin resistance was recorded. The findings suggested that repressors are more defended than sensitizers on perceptual tasks, but are less adequately defended on nonperceptual tasks.

Weinstein, Averill, Opton and Lazarus (1968) re-analyzed six studies with the prediction that repressors, as measured by MMPI scales of defensive denial, would show relatively higher scores on physiological than on self-report measures, while the reverse pattern would be found for sensitizers. The studies examined all presented the film "subincision" which has been found to produce stress reliably. Mean levels of skin resistance and heartrate were used as physiological response measures. The results were that self-report was reliably different between the two groups, with repressors reporting less psychological disturbance than sensitizers. The two groups did not differ in mean heartrate or skin resistance. These results suggest that self-report measures of defensiveness are related to self-report measures of stress, and that defensive style has little effect upon physiological reactions during stress. Perhaps defensive styles are more appropriately studied in relation to ego involving tasks where self-esteem is at risk.

As noted before, one task in which self-esteem and its defense can be studied is that of self-presentation via personality inventories, as the items presented often force subjects to choose between unfavorable self-evaluations and deceptive responses.

Psychophysiological Measurement During
Self-Disclosure via Questionnaire

Of importance in this study are psychological reactions occurring during self-disclosure via personality questionnaires as favorable and unfavorable items are rated. Of special interest are comparisons between subjects grouped by level of self-esteem or defensive response-bias. Of course we cannot directly study the inner stream of consciousness, the associations and anxieties, the sadness and anger that may be aroused by certain questions. This process is a subjective event, and as such is not directly recordable. However, indications of the process that occurs during self-evaluation can be gathered by measuring response latency and physiological indicators of arousal and from an analysis of the items presented and the responses made.

A search through the past 20 years of Psychological Abstracts was done in order to find reports of research similar to the proposed study. It was surprising to find very few studies concerning physiological arousal during self-disclosure. These studies have already been mentioned in the context of lie detection, word association and perception of emotionally significant words. None was found that used psychophysiological indicators of arousal to study the problem of defensiveness on self-report questionnaires.

Such a study has been tried by this author on two occasions. Analysis of these preliminary studies revealed several problems, but also suggested an experimental design by which data can be gathered that may be useful in studying intrapsychic conflict during self-disclosure.

The first study, conducted in the Fall of 1974 and as yet unpublished, presented 30 typewritten items via memory drum to 10 male and 10 female undergraduates at the rate of one item each 30 seconds. Half of the items concerned favorable evaluations and half concerned unfavorable evaluations of the subjects. The items were of three types. First, 10 items involving self-esteem were presented, then 10 items concerning childhood interactions with mother, and then 10 items concerning childhood interactions with father. Subjects rated their agreement with each item by pushing one of five buttons to indicate that they strongly disagreed, disagreed, were undecided, agreed, or strongly agreed with each item. Response latency and skin conductance response were recorded for each item.

The results were that strong ratings of agreement or disagreement were associated with greater skin conductance activity than less extreme ratings, and that less time was taken for the extreme ratings. These results suggest that readily accessible attitudes regarding self-esteem can be physiologically arousing, perhaps due to memory activa-

tion, or perhaps as part of a defensive reaction. Eleven subjects were selected who reported a mixture of unfavorable and favorable self-concepts, which excluded nine subjects who reported nothing but favorable self-evaluations. It was found for these 11 subjects that agreeing with unfavorable self-evaluations was more arousing than disagreeing, and similarly, that agreeing with favorable self-evaluations was less arousing than disagreeing. The findings of this study suggest that the process of revealing self-criticism is distressing and associated with physiological arousal.

The second study, also unpublished, was conducted in the Fall of 1977 as a pilot study for this dissertation. In it the same items were presented with the addition of two favorable and two unfavorable body-image items. The 34 items were typewritten, photographed, and presented as projected slides to nine male and nine female undergraduates. Two additional physiological measures were recorded as well as response latency and skin conductance. Heartrate was measured as the number of beats in a 20-second period, and as the highest and lowest heartrate derived from the inter-beat interval. In addition, two electrodes on either side of the right eye served to record eyeblinks and squinting. This exploratory measure was used because the author has observed that defensiveness or uncomfortable affect is sometimes revealed by squinting or an increased, or more

commonly, a decreased rate of blinking.

After the experiment, subjects were divided according to their ratings into low, medium and high self-esteem groups. It was found that subjects of moderate self-esteem produced fewer skin conductance responses than subjects of either low or high self-esteem. Subjects of moderate self-esteem also produced smaller skin conductance responses to unfavorable items than subjects of low or high self-esteem. Response latency was just the opposite, for subjects of moderate self-esteem took more time to decide than subjects of low or high self-esteem.

These patterns seem to indicate that subjects reporting high self-esteem were as disturbed, or even more disturbed, by unfavorable self-evaluations than were subjects of low self-esteem. Subjects of moderate self-esteem seemed both less defensive and less physiologically aroused to unfavorable self-evaluations than were subjects of either low or high self-esteem. This finding raises the question of how secure the subjects who reported high self-esteem really were. Perhaps their claims of high self-esteem were the result of a defensive response-bias of presenting a favorable image that was associated with physiological arousal due to intrapsychic conflict at some level.

These two preliminary experiments indicate that personality dynamics can be studied by presenting test items

while psychophysiological measures are recorded. And so, on the basis of limited library material, but having tested the design in two pilot studies, an experimental design was formalized and tested.

Hypotheses to be Tested

The thesis of this paper is that self-disclosing behavior is influenced by independent and sometimes conflicting motivations to enhance self-esteem and to maintain a consistent and valid self-theory. The hypothesis tested is that self-report inventories put subjects in a conflict between these two basic motivations and that this stress can be measured by autonomic reactions. Items that threaten self-esteem, and the disclosure of unfavorable self-evaluations, are both expected to be stressful. Also, responses indicative of misrepresentation (denial or repression) are expected to be associated with indicators of psychological stress. These reactions are expected when subjects answer items such as those in most personality assessment scales.

An anxiety response to unfavorable items is expected to occur mainly in subjects high on the scales of self-esteem and defensive response-bias. High self-esteem, high defensive subjects, predicted to have a vulnerable self-theory, are expected to experience anxiety during misrepre-

sentation, which can be detected using psychophysiological indicators of arousal.

In a situation of self-disclosure, many subjects theoretically feel a conflict between their desire to maintain self-esteem and their desire to maintain a consistent and valid self-theory. If this process is stressful, we can expect that deceptive responses and self-criticisms are both associated with relatively high psychophysiological reactions. Thus the results of this experiment were expected to support the thesis that people are stressed during negative self-disclosure, yet are also stressed when concealing defenses are used. In other words, in such a self-disclosing situation, subjects are expected to be stressed by both enhancement needs and consistency needs.

C H A P T E R I I

METHOD

Subject Selection

During the years 1978 and 1979, nearly 400 undergraduates were recruited from introductory psychology courses with the offer of experimental credit. They were tested in groups of up to 40. They first completed the O'Brien and Epstein self-esteem inventory (1975), which is included in appendix A. This self-esteem inventory includes a defensiveness scale consisting of items intending to discern people who are presenting an image that is socially desirable but unlikely. Many of the items are similar to those in the Crowne and Marlowe scale, but the items are rated on a five-point scale of agreement rather than as true or false.

The subjects then completed a self-report scale constructed especially for this study, labeled the personal attitudes scale. This scale first presented the 33 items of the Crowne and Marlowe social desirability response-bias scale (1960), filler items, and the items that the subjects were later presented in the polygraph phase of this study. Most of these items are modified versions of those used in

the preliminary studies by this author. Several of these items were original or modified versions of items in the O'Brien and Epstein self-esteem inventory.

A major purpose of the present study was to determine whether reliable differences exist between subjects grouped by scales of self-esteem (O'Brien and Epstein, 1975) and defensiveness (Crowne and Marlowe, 1960). For this reason, care was taken to select subjects of reasonably extreme scores on these scales, half male and half female. No significant sex differences were found on the scales of self-esteem and defensiveness. Having both sexes in the sample permitted testing for significant sex differences, and increases the generalizability of the findings.

Six groups of subjects were selected according to a division on levels of self-esteem and two levels of defensiveness. The selection of enough subjects to fill each of the extreme cells required the administration of the selection inventories to nearly 400 students in order to complete the 60-subject design.

The cut-points for subject selection on the self-esteem scale were determined by Z-scores, and were $\pm .60$. Subjects defined as having average self-esteem had scores between $\pm .60$, while subjects defined as having extreme scores had scores outside those limits. In practice, subjects with the most extreme scores were selected, so that

the majority of subjects defined as expressing low or high self-esteem had scores over one standard deviation from the mean. Crowne and Marlowe scores were acceptable if 15 or below and 18 or above. According to the normative data supplied by Crowne and Marlowe (1964), these cut-off scores are equivalent to centile ranks of 47 and 67, respectively. Table 1 shows the mean scores from each group. It can be seen that the scores are extreme enough to form distinct groups of subjects. The extreme groups of subjects selected to participate in the polygraph phase of the study are representative of the upper and lower 20% of the available subject population tested on the self-esteem scale and the upper or lower 35% tested on the defensiveness scale.

Stimulus Selection

In order to obtain a set of valid stimulus items, many possible items were rated by a sample of 180 undergraduates tested in the spring of 1978. Each item was analysed on the basis of the range of responses it elicited, and its correlation with similar items arranged as a scale. These possible test items were generated from items used in the two preliminary studies conducted by this author. On the basis of these analyses, 10 self-esteem items and 10 of the items in the defensiveness scale used in the O'Brien and Epstein self-esteem inventory were selected for further

TABLE 1
MEAN SELF-REPORT SCORES FOR EACH GROUP OF SUBJECTS

	Low Self-Esteem		Average Self-Esteem		High Self-Esteem	
	Low Defensive	High Defensive	Low Defensive	High Defensive	Low Defensive	High Defensive
Men	-1.62	-1.11	0.07	-0.25	1.16	1.46
Women	-1.84	-1.57	-0.08	0.01	1.01	1.66
Both Sexes	-1.73	-1.34	-0.01	-0.12	1.08	1.56
Self-Esteem Scores						
Men	14.4	19.4	14.0	20.0	12.6	23.2
Women	12.2	19.2	14.0	20.4	13.2	21.0
Both Sexes	13.3	19.3	14.0	20.2	12.9	22.1
Defensiveness Scores						

Note. Each of the 6 groupings of subjects by level of self-esteem and defensiveness contains 5 men and 5 women. Self-esteem was measured by the O'Brien-Epstein (1975) scale, and is expressed as z-scores with a mean of zero and a standard deviation of one. Defensiveness was measured by the Marlowe-Crowne (1960) social desirability response-bias scale which may range from 0 to 33.

study. All items chosen received some ratings in each of the five response categories of "strongly disagree," "somewhat disagree," "uncertain," "somewhat agree," and "strongly agree." Thus they are self-statements which elicit a variety of responses from people. Although there was a tendency for most people to answer the items in a favorable direction, no item was so extremely worded as to make divergent responses unlikely.

A list of these items is included in Appendix C, in the same order as presented to the subjects in the polygraph phase of the study. Each of these 20 items was typed, photographed and developed as a slide for projection onto a screen.

Procedure

Subjects selected for the intensive phase of the study were contacted by telephone. An appointment was made, and when they arrived they were briefly shown the equipment and seated comfortably in a sound-isolated cubicle. The subjects read and signed an informed consent form and the study was briefly described. Electrodes were then applied to measure heartrate, palmer skin conductance, and eyeblinks.

Heartrate was measured across the chest, using a pair of Beckman 9.5 millimeter internal diameter silver-

silver chloride electrodes and Beckman electrode paste. Palmar skin conductance was measured from the thenar and hypothenar surfaces on the non-dominant palm. Beckman 9.5 mm. silver-silver chloride electrodes were used, with Johnson and Johnson K-Y lubricant as the conductant. The constant potential between the skin conductance electrodes was .5 volts. Eyeblinks and squinting of the right eye were monitored using Beckman 4 mm. silver-silver chloride electrodes and Beckman electrode paste. One eyeblink electrode was positioned at the lower lid level on the side of the nose. The other eyeblink electrode was placed on the bony part of the cheek, approximately 1 centimeter below the outside corner of the eye. This electrode position does not interfere with vision and eyeglasses can be worn.

After the electrode leads were inserted in their appropriate connections, the response box was placed on a lap-desk that rested on the arms of the subject's chair. The response box contained five buttons, corresponding to the five response choices of strongly disagree to strongly agree used in the group-administered inventories. Subjects were instructed to press a button when they began to read each item and to release it when they completed reading. After considering the items, they were to press the appropriate button to indicate they had arrived at a rating. This procedure recorded reading time for each item as well as response latency.

After the subject indicated that he or she understood the procedure, the door was closed to prevent distractions by irrelevant stimuli. The cubicle was lit well enough for subjects to easily read the scale on the response box. The subject sat quietly for a few minutes while the experimenter adjusted a Beckman R411 dynograph recorder in the adjacent room. After the machine was calibrated, the subject was asked to take a deep breath and then blow forcibly. This procedure was used to indicate the maximum skin conductance response the subject could be expected to produce. Next the subject was asked to test each button of the response box. The response box was of wood that encased five momentary lever switches. The switches were connected in series with resistors to a battery so that the recorded voltage potential indicated which response was made.

The slide projector was turned on and the series of test items was projected, one every 28.5 seconds, onto a screen approximately one meter before the subject, at eye level. The first slide was a condensed version of the instructions and enabled the experimenter to prompt subjects who failed to signal that they were reading the statement. There was no communication during the testing period, although an intercom allowed the experimenter to hear the subject. Coughs were noted on the record to identify arti-

facts. Several subjects were lost due to technical problems or to respiratory infections.

After the final item was rated, the electrode leads were removed and subjects were shown their records. Questions were answered and there was an opportunity for the subjects to communicate their test experiences in a conversational style. In general the subjects reported stress during testing. Before leaving, subjects were given written feedback concerning the purposes and expected results of the study, and were rewarded either with a credit form stating that they participated in the experiment, or three dollars.

Dependent Measures

Psychophysiological responses were measured during the presentation of each item. The scoring period was defined as the time between 3 seconds after stimulus onset until 23 seconds after stimulus onset. The 3-second delay following onset was designed to avoid contamination of the measures by reactions to the physical stimulation of the slide change. The 20-second scoring interval included both the initial reactions to each item and the decisional process during self-rating. If a subject waited longer than the 20-second scoring period to make a response, the scoring period was split to include initial reactions and reactions

near the time of rating, both periods summing to 20 seconds in duration. However, such cases were quite rare.

During testing, heartbeats were recorded continuously and a separate channel was used to convert the inter-beat interval into heartrate in beats-per-minute. Two heartrate measures were scored, the low and the high heartrate of the greatest increase during the scoring period.

Skin conductance was recorded continuously in micromhos of conductance, measured to the nearest tenth of a micromho. The skin conductance response magnitude was defined as the increase in skin conductance during the 20-second scoring period. The number of skin conductance responses over .1 micromho in magnitude that occurred during the 20-second scoring period was also a dependent variable. Four subjects exhibited skin conductance responses that habituated so rapidly as to be useless as a measure, and were deleted from the appropriate analyses. This problem was found for two subjects of low self-esteem and two subjects of average self-esteem, and was evenly distributed between low and high defensiveness.

Electromyographic activity in the eye area was scored in two ways. The number of eyeblinks during the scoring period was counted using a criterion of one micro-volt or greater to define a blink. Squinting was defined

as a period with electromyographic activity of at least one microvolt in amplitude, and was measured to the nearest tenth of a second. Response latency was measured, to the nearest .1 second, from stimulus onset until a button was pushed by the subjects to indicate a rating of agreement. Reading duration was measured as the time during which the subjects indicated they were reading each item by pushing a button.

Measurement problems. The measures of eyeblinks and squinting were extremely difficult to score. The general pattern is of blinks having sharp rise times and distinct peaks, while squints are trains of lower amplitude EMG. The data were carefully scored in order to preserve a consistent criteria for scoring. However, for two subjects, the electromyographic record could not be reliably scored, and these subjects were deleted from the relevant analyses. For many other subjects, there was some confusion between the eyeblink and squinting measures. The eyeblink data from four subjects were deleted due to this problem. If there was doubt, electrical activity was scored as a squint rather than a blink. A transocular EMG record that was easy to interpret was obtained from only about half of the subjects.

The difficulty in obtaining psychophysiological measures is a problem that should not be ignored, for economic factors exist in research as well as other fields.

Exploratory studies such as the present one can serve to direct future research and clinical techniques toward measures that are reliable, valid and economical to gather and interpret. Such considerations will be addressed later in the conclusion section.

Correcting for individual differences in level of response.

As is well known, people vary in their mean level of resting physiological measures and also vary over time and behavior. A clear example of this problem is that one subject had a mean response latency of 4.1 seconds, while another had a mean response latency of 15.0 seconds. This problem is reduced by the use of repeated measures but is important to consider.

Because of the problem of individual differences in mean response level, all the statistical analyses of psychophysiological measures were done not only for the raw data, but also in range-corrected form. Range correction was done by first calculating, for each subject, the mean and standard deviation for each measure over the 20 test items. Then each measure for each item was expressed in terms of standard deviation units relative to the range of the individual subject on that measure. The range-correction produced more reliable results for a few analyses, but in general the range-corrected data did not differ much from the non range-corrected data. For this reason,

only the non range-corrected data will be reported, except in cases where the range-corrected data add to an understanding of the results.

C H A P T E R I I I

RESULTS

The General Effect of the Situation

The subjects in this experiment were tested in two contrasting situations: group testing with pencil and paper, and individual testing with a polygraph. It is probable that the differences in physical activity are far less important psychologically than the differences in subjective attitudes. For all subjects, it was a novel experience to be attached to seven electrodes in a sound-isolated cubicle while a large and complicated machine in the next room recorded heartbeats, palm sweat and eye movements (they were not told that response latency, blinks, or squints were the actual measures until later).

This was not only a novel situation but ego threatening in the sense of the demand to disclose personal attitudes related to self-praise and self-criticism while being monitored with a device commonly known as a lie-detector. Although an attempt was made to put subjects at ease, it is safe to assume that most subjects felt some degree of anxiety.

Although one can but guess at psychophysiological differences between the contrasting test situations, it is

possible to analyze some of the differences in self-report, for the items presented during the polygraph phase were presented earlier during individual testing. These 20 items, as described earlier, were selected to form four scales of five items each: self-esteem items worded in a favorable manner, self-esteem items worded in an unfavorable manner, defensiveness items worded in a favorable manner, and defensiveness items worded in an unfavorable manner.

The reliability of these scales has been measured in two ways. One method used the 'alpha' reliability formula developed by Cronback (1967), which is similar to a split-half reliability but computes the average reliability of all combinations. When the alpha reliability coefficient was calculated for the test items during the group testing, the scores for the favorable self-esteem items, the unfavorable self-esteem items, the favorable defensiveness items and the unfavorable defensiveness items were, respectively, .57, .80, .73 and .63. When calculated over the same subjects and items during intensive testing, the same scales produced reliability coefficients of .68, .82, .70 and .74 respectively. A test-retest analysis was also performed by correlating scale scores during group testing with those during intensive testing. The test-retest reliability coefficients were, respectively, .79, .76, .67 and .66. The

conclusion from these reliability analyses seems to be that the items were arranged within reasonably homogeneous scales. Coefficients in the .60s and .70s are all that can be expected from five-item scales.

Subjects as a whole did not reliably change their scale scores from the group to the individual testing. A series of T-tests found non-significant trends toward an increase in the rating of agreement to both favorable and unfavorable self-esteem items, $\underline{T} = 1.62$, $\underline{p} = .10$, and $\underline{T} = 1.09$, $\underline{p} < .25$, respectively. Favorably worded defensiveness items tended to be agreed with less during individual testing, $\underline{T} = 1.17$, $\underline{p} < .20$, while unfavorably worded defensiveness items tended to receive more agreement, $\underline{T} = .78$, $\underline{p} < .25$. These trends are all approximately one-half of a unit on a five-unit scale and, although not reliable enough to be statistically significant, suggest that subjects as a whole in the individual testing situation were more likely to present stronger self-attitudes, and yet be discriminating enough to present less of a defensive facade. However, as these are only trends, this speculation will be considered no further.

Another consideration is whether subjects, grouped by self-esteem and defensiveness scores, changed their self-report data to the same degree. Analyses of variance testing this interactive effect found no reliable differ-

ences between groups of subjects. It seems that subjects maintained their characteristic style of self-presentation between the group and individual test situations.

Analysis of Repeated Presentation of Items

After the data had been checked for errors, a full analysis of variance was performed for each psychophysiological variable. A full analysis included the between-subject variables of level of self-esteem, level of defensiveness, and sex. Within-subject variables included whether the item presented related to self-esteem or defensiveness, whether the item presented was favorable or unfavorable, and the repetition of five similar items.

Sex differences. A few sex differences were found to be reliable but not important to the area explored by this study. Heart rate was significantly higher for women than for men, $F(1,34) = 7.50$, $p = .009$, with means of 71.0 and 63.9 beats per minute, respectively. Women also read the statements more quickly on the average than men, $F(1,59) = 6.82$, $p = .012$, with means of 3.2 and 4.3 seconds, respectively. There were no significant sex differences other than these.

Habituation. The full analysis of variance showed a strong effect on most of the physiological measures, which is

attributable to large reactions to the first item and, to a lesser extent, the second item.

Habituation of skin conductance and heartrate measures was rapid. The average response for the third item was similar to the responses to the remaining items. The measures of reading time and response time were elevated only for the first item. Neither the measure of squinting nor the count of eyeblinks differed significantly as a function of trials, which casts doubt on their validity as reliable measures of stress.

Because the first one or two items produced relatively intense responses, it was decided to delete these items from further analyses of the data. This is because, for most measures, the psychological stress induced by the initial items overshadowed the relatively less intense effects of the type of items presented.

Analysis of the First Item

Before the initial items are disregarded, it is important to consider whether there were any group differences in reaction to the initial item, an unfavorable self-esteem statement. This item, "I give in to others too easily," can be expected to be relatively stressful, being the first self-disclosure asked of the subject during the intensive portion of the study.

Response latency, measured in seconds from the onset of the first item until the rating of degree of agreement was signalled, varied reliably with the interaction of the between-subjects variables of level of self-esteem and level of defensiveness, $F(2,51) = 5.05$, $p = .011$. The same measure range-corrected for each subject relative to his or her distribution of scores over all 20 trials, also showed a significant interaction effect, $F(2,50) = 6.43$, $p = .004$. The results, presented in Table 2, show little difference between subjects of low and high defensiveness except in subjects of high self-esteem. The response latency of the high self-esteem, high defensive subjects was much greater than that of the high self-esteem, low defensive subjects. For this measure, defensiveness seemed more important in the high self-esteem group than in the other groups. For the initial item, there were no reliable group differences in reading duration, or in other measures, including frequency and magnitude of skin conductance responses.

The significant finding concerning response latency to the initial raise the question of whether these group differences persist. An analysis of the remaining 18 items found no reliable group differences in response latency.

Basal skin conductance level showed a reliable relationship with level of self-esteem. Subjects of low, average and high self-esteem had an average skin conductance

TABLE 2
RESPONSE LATENCY FOR THE INITIAL SELF-DISCLOSING ITEM

	Low Self-Esteem		Average Self-Esteem		High Self-Esteem	
	Low Defensive	High Defensive	Low Defensive	High Defensive	Low Defensive	High Defensive
Response Latency in Seconds	8.4	8.1	8.1	7.2	6.6	11.7
Response Latency Range Corrected	-.01	-.45	-.26	-.59	-.67	.65

Note. Response latency was measured from slide onset to the rating of agreement or disagreement. Range corrected scores were computed as z-scores for each subject, relative to his or her average response latency over 20 trials.

at the time of presentation of the initial self-evaluation item of 11.0, 6.0 and 9.4 micromhos, respectively, $F(2,59) = 5.24$, $p = .009$. This relationship between level of self-esteem and skin conductance level was significant throughout the experiment. A conservative test of this is to average the skin conductance level over the 18 remaining items so as to have one score per subject. This analysis of variance was done, and found a reliable relationship between skin conductance level and level of self-esteem, $F(2,39) = 4.57$, $p = .015$. The means for the low, average, and high self-esteem groups were, respectively, 10.1, 5.6 and 9.0.

Because skin conductance level is a measure of activation rather than reaction, it is not useful as a measure of response to specific questionnaire items. For this reason, skin conductance level will not be reported further, although the reliable relationship with the level of self-esteem will be discussed.

When the data from the second trial were analyzed, no reliable group effects were found other than the sex difference in heartrate, and the relationship between skin conductance and self-esteem, both of which have already been reported.

Analysis by the Type of Item Presented

The remaining 18 items were analyzed by averaging,

for each subject, the responses for each type of item. The data were collapsed by averaging, for each subject, the measures obtained after presenting each of four or five items of similar favorability and type (self-esteem or defensiveness). Because the first item was an unfavorable self-esteem item and the second was a favorable defensiveness item the mean response for these types of items was obtained by averaging over four items. The mean response for favorable self-esteem items and unfavorable defensiveness items were obtained by averaging over five items.

Statistical power is lost during this process, because fewer cells of data are analyzed. This loss is partially compensated by the fact that the average response is more reliable. The standard error of the mean of four samples has approximately half the standard error of the four samples individually. However, the loss of data does make this a conservative test that would reduce the chance of a false positive error. All the subsequent analyses of variance performed upon the data organized by the type of item presented, or later, by the type of response emitted, have been done on the data not including items one and two.

The analysis of each subject's average response to each type of item allows a test for significance with the 60 subjects grouped by level of self-esteem and by level of defensiveness. Within each subject there were two

crossed classes of items presented: favorable versus unfavorable self-related items, and self-esteem versus defensiveness items. The between-subjects grouping variables and the within-subjects variables were also analyzed for interaction effects. The results presented below will include only significant findings, except in cases where the lack of such a reliable result is of theoretical interest.

Latency measures. For the measures of response latency, there were reliable effects attributable to the type of item presented. There were no reliable interactions that included the between-subjects variables of level of self-esteem or level of defensiveness.

Response latency was significantly longer for the defensiveness items than the self-esteem items, $F(1,48) = 28.45$, $p < .001$. This may be viewed in Figure 1, which also demonstrates that the response latency for unfavorable items was significantly longer than the response latency for favorable items, $F(1,48) = 15.77$, $p < .001$. The interaction between these effects was also significant, $F(1,48) = 9.73$, $p = .003$, and is obviously due to the relatively greater difference between the favorable and unfavorable self-esteem items as compared to the favorable and unfavorable defensiveness items.

The portion of time that the subjects reported being engaged in reading items was significantly longer for the

defensiveness items as compared to the self-esteem items, $F(1,54) = 112.32$, $p = .001$. Also, reading duration for unfavorable items was longer than that for favorable items, $F(1,54) = 9.82$, $p = .003$. There was also a significant interaction between content and favorability of the items presented, $F(1,54) = 5.30$, $p = .025$. As Figure 1 shows, favorability had more of an effect for the self-esteem items.

Both of these latency measures, the time spent reading the items, and the total time considering the items before responding, show that the subjects spent more time considering the defensiveness items than the self-esteem items. However, in evaluating this effect, it should be noted that the items were not of the same length. The mean length of the favorable self-esteem items, the unfavorable self-esteem items, the favorable defensiveness items and the unfavorable defensiveness items were, respectively, 7.4, 7.0, 9.5 and 10.4 words. Because the defensiveness items were longer than the self-esteem items, it is logical that they would take longer to read. Thus, although the difference is statistically significant, it can be attributed to the length of the items.

Both reading duration and response latency were longer for unfavorable than favorable items, which was an especially strong effect for the self-esteem items as com-

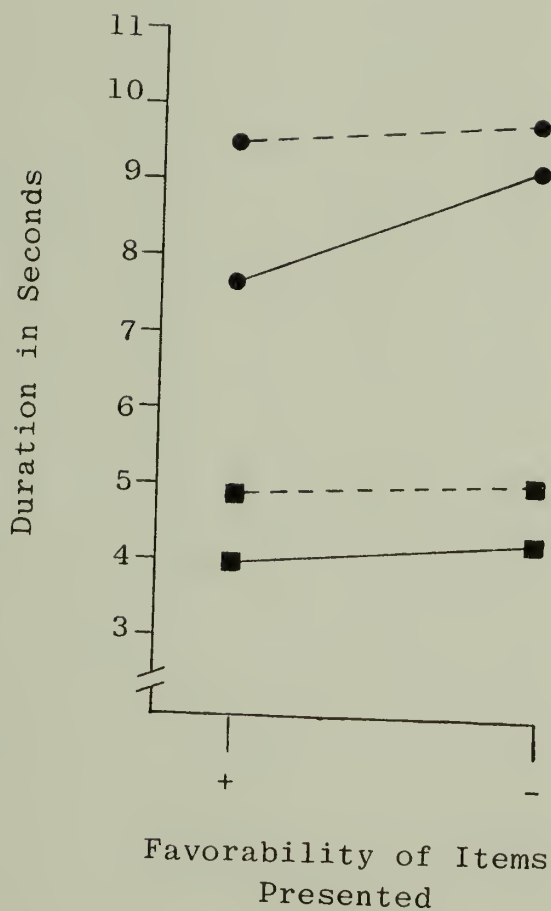


Figure 1. Reading duration and response latency for data collapsed by the type of items presented.

● = response latency — = self-esteem items
 ■ = reading duration - - - = defensiveness items

pared to the defensiveness items. This result is evidently of psychological origin, for although the unfavorable self-esteem items contained fewer words than the favorable self-esteem items, subjects took longer to read them and to respond to them.

Physiological measures. The measures of skin conductance, heartrate, eyeblinks, and transocular electromyographic activity (squints) were measured during the presentation of each item. Several of these measures, despite the expenditure of much time in accurate scoring, were not found to be significantly related to the experimental variables. These were the count of eyeblinks, squinting time, heartrate mean and the increase in heartrate. Analyses of these measures will not be reported, although the lack of significant relationships will be discussed.

The count of skin conductance responses was reliably related to several experimental variables. As Figure 2 shows, subjects as a whole responded with more skin conductance responses to the self-esteem items than to the defensiveness items, $F(1,48) = 8.26$, $p = .006$. More skin conductance responses were also produced while viewing unfavorable items than favorable items, $F(1,48) = 5.63$, $p = .022$. There was a nearly significant interaction between the two main effects, $F(1,48) = 3.74$, $p = .060$. When the data were range-corrected, F-ratios increased and

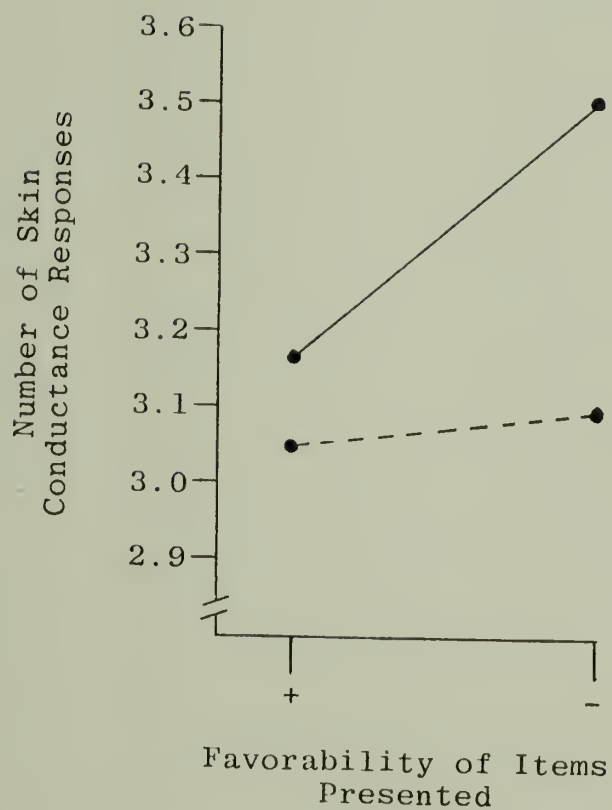


Figure 2. Number of skin conductance responses for data collapsed by the type of items presented.

— = self-esteem items - - - = defensiveness items

the interaction effect became significant, $F(1,48) = 6.59$, $p = .014$. The interaction effect is that there is more of an increase between favorable and unfavorable self-esteem items than between favorable and unfavorable defensiveness items.

The frequency of skin conductance responses showed a reliable third-order interaction between level of self-esteem, item content and item favorability, $F(2,48) = 5.87$, $p = .005$. In Figure 3 it can be seen that the low self-esteem group and especially the high self-esteem group reacted with relatively more skin conductance responses to the unfavorable self-esteem items than to the favorable self-esteem items. When one looks at the defensiveness items it can be seen that this effect is reversed, as the average self-esteem group reacted relatively less to favorable than unfavorable defensiveness items. The low self-esteem group produced equivalent responses, and the high self-esteem group reacted relatively more to the favorable defensiveness items. Also, it can be seen that the response pattern for the low self-esteem and the high self-esteem groups resemble one another more than they do the pattern of the average self-esteem group.

The fourth-order interaction of the above interaction with the additional variable of level of defensiveness was also significant $F(2,48) = 3.64$, $p = .034$. In order to elucidate this complex interaction shown in Figure 4,

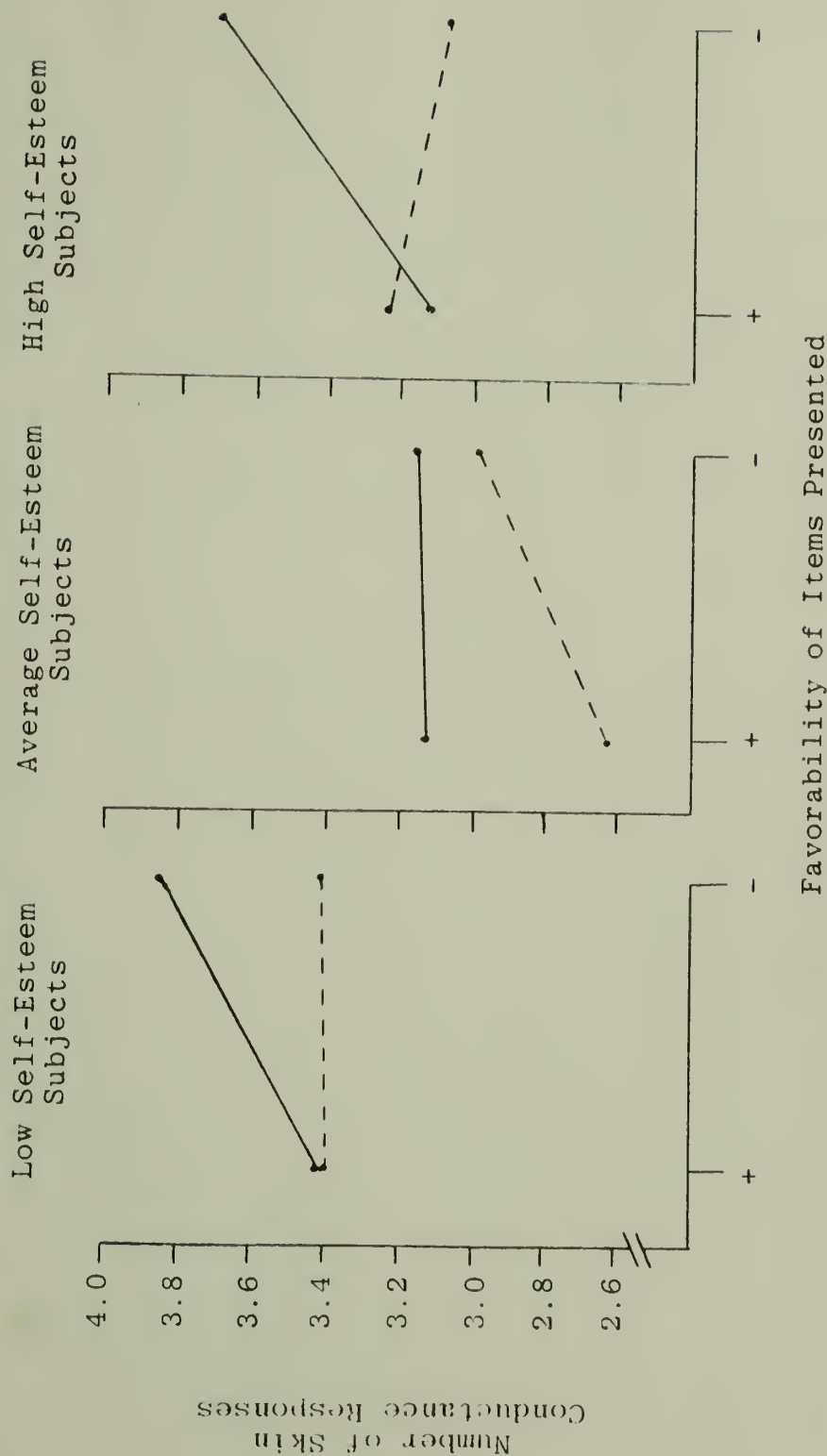


Figure 3. Number of skin conductance responses for subjects grouped by level of self-esteem and data collapsed by the type of items presented.

— = self-esteem items - - - = defensiveness items

separate analyses were done for each level of self-esteem. The 18 subjects of low self-esteem produced frequencies of skin conductance responses that varied reliably with the interaction of level of defensiveness, item content and item favorability, $\underline{F}(1,16) = 7.68$, $\underline{p} = .014$. The 19 subjects of average self-esteem did produce a significant interaction of item content and item favorability, $\underline{F}(1,17) = 4.55$, $\underline{p} = .048$, but this interaction was only moderately influenced by level of defensiveness, $\underline{F}(1,17) = 2.39$, $\underline{p} = .141$. The 20 subjects of high self-esteem also produced a significant interaction of item content and item favorability, $\underline{F}(1,18) = 7.39$, $\underline{p} = .014$, but there was no higher-order interaction at all related to level of defensiveness, $\underline{F}(1,18) = .00$, $\underline{p} = .96$. Thus the complex interaction including the effects of level of self-esteem, level of defensiveness, item content and item favorability seems due to the relatively frequent skin conductance responses produced by the low self-esteem, low defensive subjects when they were presented with favorable defensiveness items. It is noteworthy that in this analysis the high self-esteem subjects responded in much the same manner as the low self-esteem, low defensive subjects, those with the least effective ego-defenses.

Palmar skin conductance response magnitude, measured in micromhos, was greater for self-esteem items than for defensiveness items, $\underline{F}(1,48) = 4.45$, $\underline{p} = .040$, with

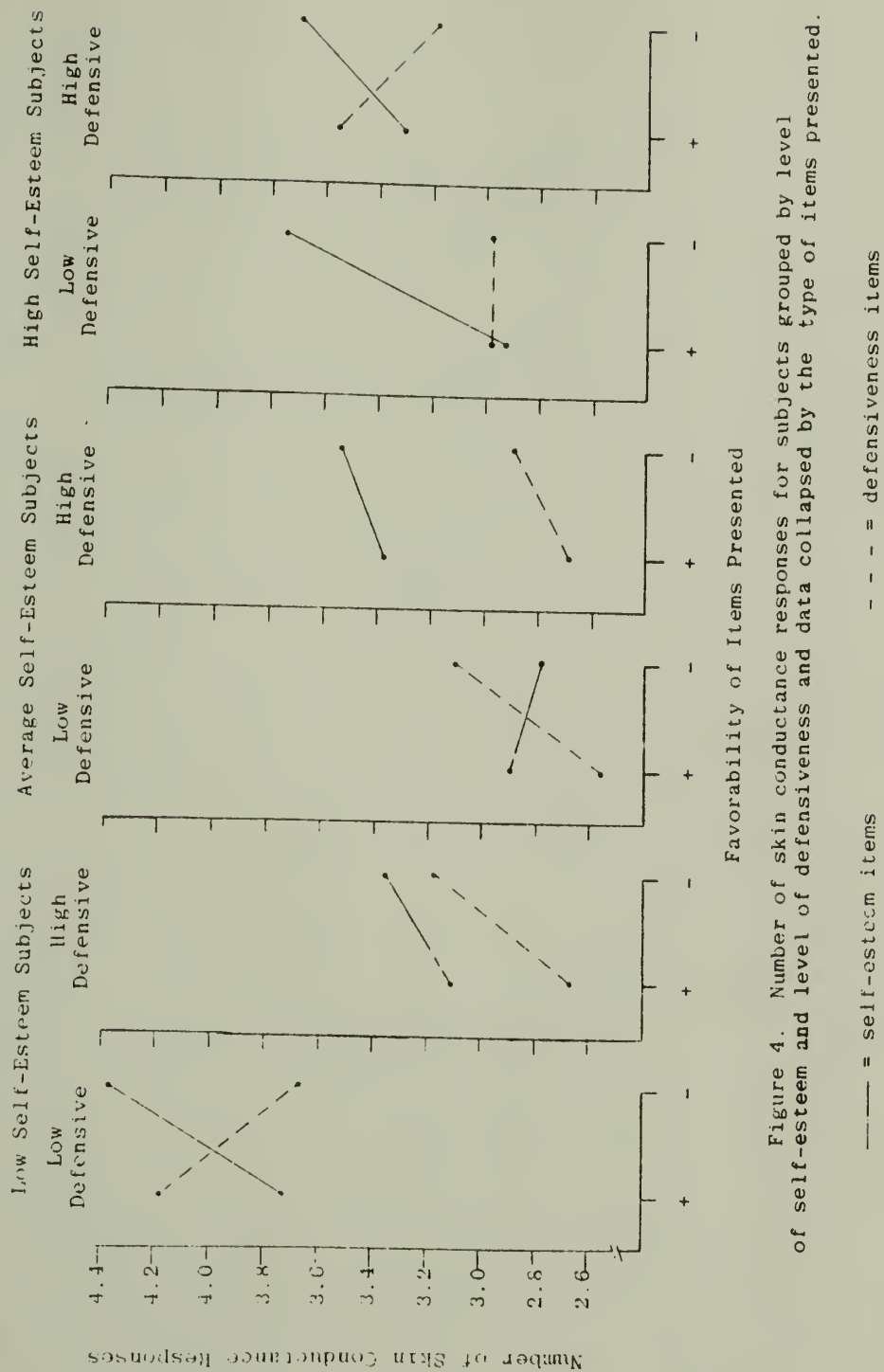


Figure 4. Number of skin conductance responses for subjects grouped by level of self-esteem and level of defensiveness and data collapsed by the type of items presented.

means of 1.01 and .89 micromhos, respectively. This effect was more reliable, $F(1,48) = 6.41$, $p = .015$ when skin conductance was range corrected. There was also a significant third-order interaction between level of self-esteem, level of defensiveness, and the favorability of the item presented, $F(2,48) = 5.04$, $p = .101$. Figure 5 illustrates this interaction. Because this is a complex interaction, separate analyses of variance were done for each level of self-esteem. No reliable effects were found for either the low self-esteem or the average self-esteem groups. The high self-esteem group produced a significant interaction between level of defensiveness and item favorability, $F(1,18) = 12.03$, $p = .003$. Figure 5 shows that although the number of skin conductance responses to the unfavorable items was similar for the two high self-esteem group, subjects of high self-esteem, high defensiveness produced relatively more responses to the favorable items.

Summary of the analysis of type of items presented. Several of the findings can be summarized in terms of the effects of the type of items presented. Both reading duration and response latency were longer for the defensiveness items than the self-esteem items. This effect is attributable to relatively longer items.

Reading duration and response latency were longer for unfavorable than favorable items. This effect was more

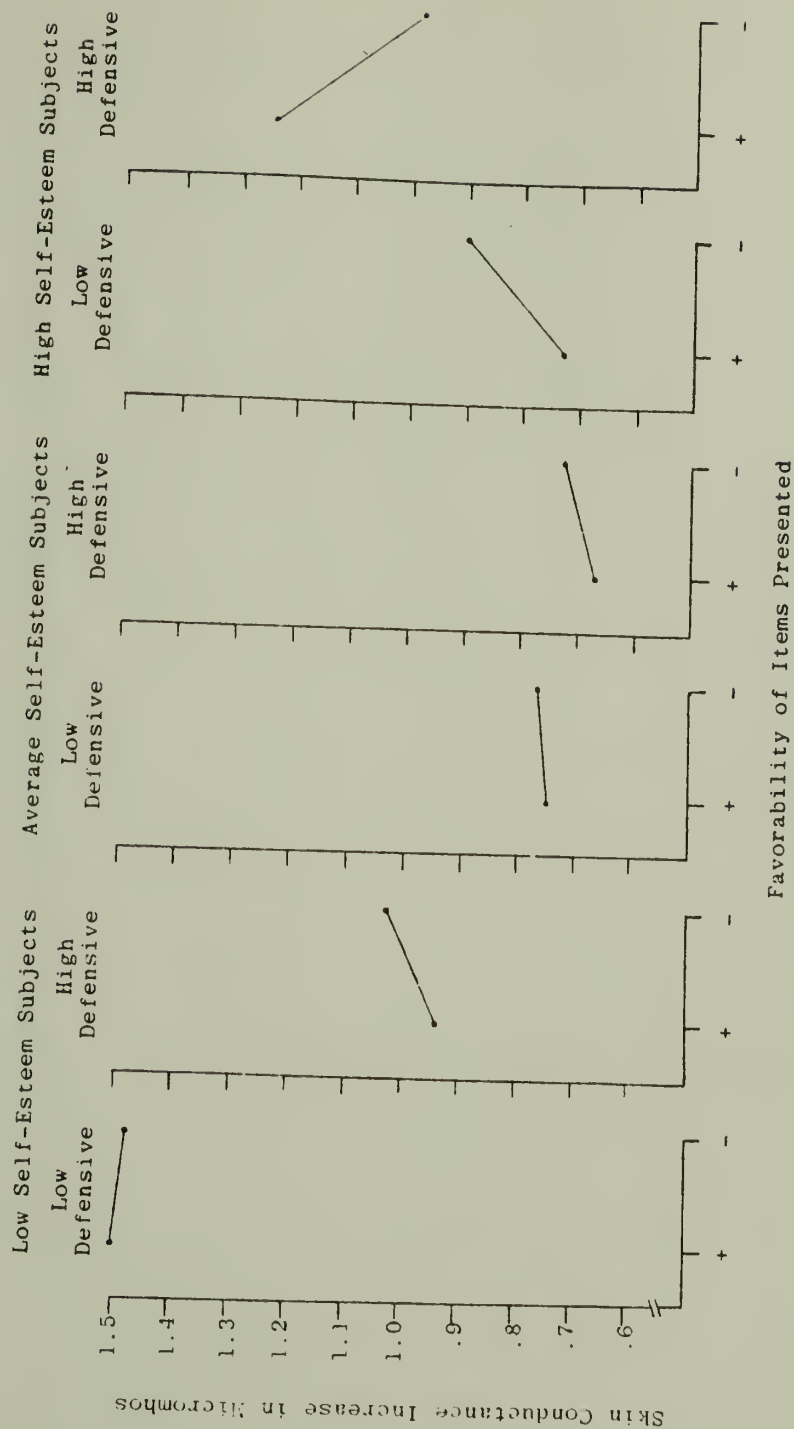


Figure 5. Skin conductance response magnitude for subjects grouped by level of self-esteem and level of defensiveness and data collapsed by the favorability of the items presented.

significant for self-esteem items than for the defensiveness items. These reliable effects run counter to the actual length of the items and so can be attributed to psychological factors related to the favorability of the items presented.

The psychophysiological measures of heartrate and eyeblinks were not significantly related to the experimental variables. The number of skin conductance responses and, to a lesser extent, the magnitude of the greatest skin conductance response, were better measures. Each was greater for the self-esteem items than for the defensiveness items. The number of skin conductance responses to the unfavorable items was greater than to the favorable items. This effect was relatively more significant for the self-esteem items than for the defensiveness items.

Because both the response latency and the skin conductance measures varied over the type of items presented in a similar manner, this supports the view that they both indicate stress. However, this is not a simple relationship, as will be evident later.

Level of self-esteem and level of defensiveness were not related to the response latency measures, but were related to the skin conductance measures. As reported before, the number of skin conductance responses was greater for unfav-

avorable items than for favorable items, which was especially true for the self-esteem items as compared to the defensive-ness items. However, the favorability of self-esteem items produced little effect on the number and magnitude of skin conductance responses produced by the subjects of average self-esteem. In contrast, the low and the high self-esteem groups both reacted relatively strongly to the unfavorable self-esteem items.

Analysis by Type of Responses

The data gathered in this study can be analyzed not only by the type of items presented but also by the type of responses emitted by the subjects. One way to categorize responses is by ratings from "strongly disagree" to "strongly agree." Another method is to analyze responses as to whether they were favorable or unfavorable self-evaluations of the subjects. The data have been analyzed in both ways, but before presenting the findings, several problems that arise in this type of analysis must be addressed.

The major problem in analyzing data by the responses made is that the data have unequal representation in different cells. People have definite biases and do not distribute their responses evenly. This means that in order to perform an analysis of variance that compares groups of

subjects, it is necessary to collapse the data so as to have comparable data for each subject.

This problem is illustrated in the first of the analyses to be considered, that of organizing the data by ratings of agreement.

Collapsing of data by ratings of agreement. Just as with standard personality inventories, subjects had only a limited number of responses possible. The subjects could choose among "strongly disagree," "somewhat disagree," "uncertain," "somewhat agree," and "strongly agree." The proportion of ratings made in each category was, respectively, 18%, 23%, 8%, 33%, and 18%. These proportions were averaged over all subjects. Some individuals never rated "strongly disagree" or "uncertain." This response-bias is of interest in itself, as will be reported, but presents a problem for collapsing the data by the type of response.

This problem necessitated a collapsing of the data to obtain equal representation for all subjects. The process of collapsing data within subjects does cost statistical power, for some of the repeated sampling is lost. For example, the "average subject" made 4 responses of "strongly disagree," 5 responses of "somewhat disagree," 2 of "uncertain," 6 of "somewhat agree" and 3 of "strongly agree" over the 20 test items. Thus the data can be collapsed to give that subject's average physiological

response while he or she strongly disagreed with four items, and the average response while rating "uncertain" twice, etc. This was done for each subject. Having organized the data into the one best estimate of that person during each type of response, the data are more compact, but some statistical power is lost. It is not possible to estimate this loss, but it is of course somewhat countered by the increase in the reliability of the averaged measure.

Data are lost in this collapsing process in another way. Some subjects never made responses in some categories. If a subject never rated "uncertain" in response to an item, that subject cannot be compared to other subjects during this analysis and must be deleted even if responses were made in the other categories. In fact, this problem was so severe that the analysis to compare groups of subjects across the five ratings could not be done. A total of 23 subjects never used "uncertain" in their ratings during individual testing. This is of concern in itself, and so the number of subjects who responded in this manner was compared for the subjects grouped by level of self-esteem and level of defensiveness. Table 3 shows the distribution of subjects who never used "uncertain" as a rating.

As can be seen, nearly all the subjects in the high self-esteem, low defensive group used a rating of

TABLE 3
THE NUMBER OF SUBJECTS IN EACH GROUP FAILING TO USE A RESPONSE
CATEGORY DURING INDIVIDUAL TESTING

	Low Self-Esteem		Average Self-Esteem		High Self-Esteem	
	Low Defensive	High Defensive	Low Defensive	High Defensive	Low Defensive	High Defensive
Number of subjects in the group who never used "uncertain" as a rating	4	3	3	3	2	8
Number of subjects in the group who never used "strongly disagree" as a rating	4	5	2	5	0	0

Note. There are 10 subjects in each group.

"uncertain" at least once during the 20 items, but nearly all the high self-esteem, high defensive subjects failed to use this rating. A chi-square analysis of the whole table was not significant, and an analysis of the two high self-esteem cells alone yielded a chi-square of 3.6, which at one degree of freedom did not quite reach significance at the .05 level, which requires a chi-square of 3.84. This result suggests the hypothesis that high self-esteem, high defensive subjects have an aversion to uncertainty regarding self-relevant items. Further research is needed to test this hypothesis.

There were also a number of subjects who failed to use the rating of "strongly disagree" at least once during the intensive testing. As Table 3 shows, all the high self-esteem subjects used this rating at least once. A chi-square analysis of this response-bias found a significant relationship between the grouping of subjects by level of self-esteem and the number of subjects in each group who never used "strongly disagree." The chi-square calculation is 8.37, which at two degrees of freedom is significant at $p < .025$. The finding that all the high self-esteem subjects used this rating, while nearly half of the other subjects did not, indicates that extreme ratings are characteristic of this group. This is not surprising of course, as this is the reason they received extreme scores.

While outside the scope of this study, a response-bias such as this is certainly a major part of the differences between scores of subjects. For a person to score high relative to other people, he or she must use relatively extreme ratings, and so must strongly disagree with unfavorable items. What is more important is the unwillingness of almost one-third of the subjects to use this rating. Perhaps this bias indicates timidity. For the purposes of this psychophysiological study, however, this response-bias was a problem because subjects had to be deleted from analyses when they failed to produce the responses being compared.

The data were prepared by averaging, for each subject, the psychophysiological reactions accompanying each type of rating. This was done by selecting the appropriate data and then computing the average response for each subject over several classes of response. The data were scanned for subjects with missing data, who were deleted so that all the remaining subjects had an equal number of data points, one for each rating category. Data for each subject at this point had the same format and the only inequality was the number of subjects within each group. A repeated analysis of variance with unequal group sizes was then performed. All the analyses of data organized by the type of response went through this process of averaging within response cate-

gories, deleting subjects with missing data, and performing analyses of variance on the psychophysiological data.

Analysis of data organized by rating. As explained above, the data to be analyzed consisted of the average response of a subject for each rating category. Because over one-third of the subjects did not use the rating of "uncertain", this category was omitted from further consideration. Thus, the only subjects who were deleted were those who failed to use a category other than "uncertain." This left 42 subjects, with a minimum of five subjects in a cell.

Latency measures. Subjects as a whole took significantly longer to disagree with items than to agree with items, $F(1,36) = 22.76$, $p < .001$, with means of 9.4 and 8.2 seconds, respectively. Response latency was significantly shorter for strong than for moderate ratings, $F(1,36) = 20.84$, $p < .001$, with means of 8.0 and 9.6, respectively.

Reading duration showed similar effects. It was significantly shorter prior to agreement than to disagreement, $F(1,36) = 4.29$, $p = .046$, and significantly shorter prior to strong ratings than to moderate ratings, $F(1,36) = 5.73$, $p = .022$.

Physiological measures. The count of skin conductance responses over the different ratings of agreement did not produce significant results. Although not reliable enough to be significant, the results did run parallel to

the magnitude of the skin conductance response, which varied directly with the strength of the rating made, $F(1,36) = 7.70$, $p = .009$. There was an interaction between strength of rating and whether the rating was one of agreement or disagreement, $F(1,36) = 5.50$, $p = .025$, with the increase between moderate and strong agreement being greater than the increase between moderate and strong disagreement. This is partially accounted for by the higher-order interaction between this interaction and the grouping of subjects by level of self-esteem, $F(2,26) = 5.21$, $p = .010$. The relatively large responses during strong agreement are largely due to the low self-esteem subjects and, to a lesser extent, to the high self-esteem subjects, as the subjects of average self-esteem did not produce this effect.

Summary of the analysis by rating of agreement. It is clear that subjects took longer to disagree than to agree, and that extreme ratings were made quicker than moderate ratings. Skin conductance response magnitude was also greater for extreme ratings, although the number of skin conductance responses was not reliably related to these effects. Higher-order interactions are difficult to interpret because this analysis fails to take into account the favorability or unfavorability of the item to which the rating was a response.

Analysis of data by favorability of self-evaluation.

Statistical procedure. At this level of analysis, several of the major hypotheses examined during this study, that is, the relative responses during favorable or unfavorable self-evaluation, are tested. As explained earlier in this paper, the data must be collapsed in order to obtain adequate samples within each type of response being analyzed. In order to analyze the effect of favorable or unfavorable self-evaluation it was necessary first to reduce the five ratings of degree of disagreement and agreement to a simpler rating of either disagreement or agreement.

It is widely reported that self-disclosures tend to be rated in a direction favorable to the self, and this study was no exception. Because of the bias toward favorable self-presentation, the subjects considered as average in self-esteem reported generally favorable self-concepts. Because of this favorable bias and in order to obtain roughly balanced data, a rating of "uncertain" was classified as an unfavorable self-evaluation if it was made in response to either favorable or to unfavorable items.

Agreement with favorable items and disagreement with unfavorable items were both considered as responses of favorable self-evaluation. Similarly, disagreement with favorable items and agreement with unfavorable items were both considered as responses of unfavorable self-evaluation.

By following the above procedures, the data were collapsed into reports of favorable and unfavorable self-evaluations to the self-esteem items and to the defensiveness items. Favorable self-evaluations in response to defensiveness items were considered for this study to indicate deceptive responses, characterized as "little white lies" regarding the self. Unfavorable self-evaluations in response to the defensiveness items were considered for the purpose of this study to indicate unfavorable but generally true self-evaluations.

It was found that two-thirds of the subjects produced one or more responses (out of a possible nine) in each of these four categories of favorable and unfavorable self-evaluations in response to either self-esteem or defensiveness items. The responses made by each subject within each category were averaged in order to obtain a single measure in each category for analyses of variance.

Eleven subjects failed to make at least one response in each of the four response categories. Six of these were high self-esteem subjects who never responded in a manner unfavorable to themselves. Three low self-esteem subjects were deleted because they failed to produce a response classified as a favorable self-evaluation. Two subjects failed to produce a response classified as deceptive. Most subjects, however, produced at least

one response in each category. The number of subjects remaining in each group consisted of 7 low self-esteem, low defensive subjects, 10 low self-esteem, high defensive subjects, 9 average self-esteem, low defensive subjects, 8 average self-esteem, high defensive subjects, 8 high self-esteem, low defensive subjects, and 4 high self-esteem, high defensive subjects. These 46 subjects responded in a manner that allowed the testing of the effect of making favorable versus unfavorable self-evaluations, the effect of self-esteem items versus defensiveness items, and higher-order interactions including group effects.

Latency measures. There was a reliable interaction between whether an item was a self-esteem or defensiveness item and whether the rating in response was a favorable or an unfavorable self-evaluation, $F(1,34) = 4.06$, $p = .052$. Figure 6 shows that subjects were quicker to express favorable self-evaluations than unfavorable self-evaluations in response to the self-esteem items. In response to the defensiveness items this trend did not occur.

Physiological measures. Skin conductance response magnitude was greater during favorable than unfavorable self-evaluation, $F(1,37) = 8.08$, $p = .007$. Similarly, there were more skin conductance responses during favorable than unfavorable self-evaluation, $F(1,38) = 5.06$, $p = .030$. However, these results should be interpreted in light of

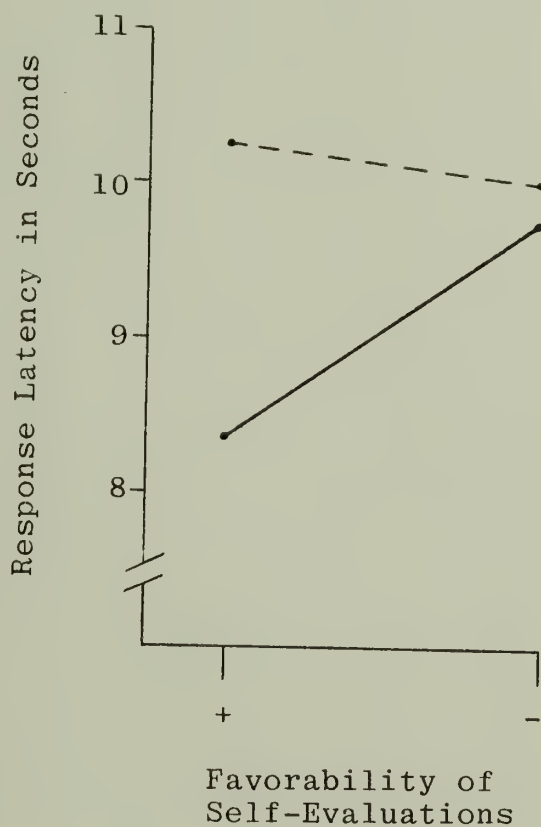


Figure 6. Response latency for data collapsed by the type of items presented and the favorability of self-evaluations.

— = self-esteem items - - - - = defensiveness items

significant group effects.

The results concerning the measure of the number of skin conductance responses are largely explained by the significant interaction between the favorability of the self-evaluation, the type of items presented, and the grouping of subjects. Level of self-esteem interacted to a moderately significant degree with the type of items presented and the favorability of self-evaluations, $F(2,38) = 3.35$, $p = .041$. The results have been graphed in Figure 7.

This figure shows that subjects of all levels of self-esteem produced more numerous skin conductance responses when reporting favorable self-evaluations than when reporting unfavorable self-evaluations in response to the defensiveness items. This effect was predicted, for favorable self-evaluation in response to defensiveness items was defined as probable deception.

Responses were more complex when the self-esteem items were considered. Low and average self-esteem subjects tended to produce more skin conductance responses when reporting unfavorable than favorable self-evaluations. The high self-esteem subjects produced equivalent skin conductance responses during unfavorable self-evaluation when responding to the self-esteem items. However, they exhibited relatively numerous skin conductance responses when reporting favorable self-evaluations in response to self-

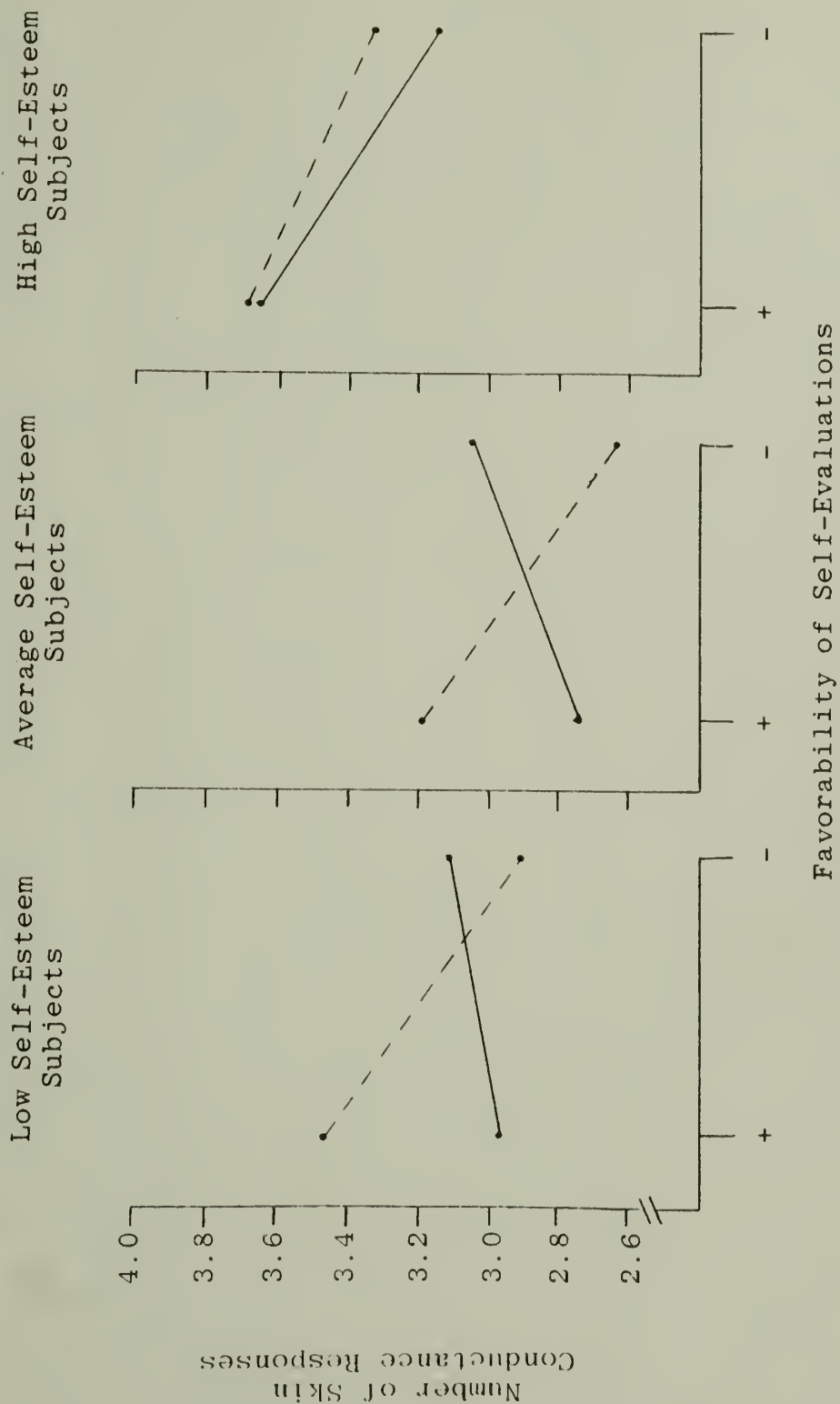


Figure 7. Number of skin conductance responses for subjects grouped by level of self-esteem and data collapsed by the type of items presented and the favorability of self-evaluations.

esteem items.

When subjects were grouped by level of defensiveness, and the number of skin conductance responses were analyzed, a significant interaction was found between level of defensiveness, the type of items presented, and the favorability of self-evaluations, $F(1,28) = 5.34$, $p = .027$. The results are shown in Figure 8. This figure shows that subjects high on the defensiveness scale responded to self-esteem and defensiveness items in a similar manner, based on the favorability of the self-evaluation. Low defensive subjects produced skin conductance responses similar to high defensive subjects when defensiveness items are considered. However, low defensive subjects produced fewer skin conductance responses to favorable self-evaluations in response to self-esteem items.

Because these interactions concerning the number of skin conductance responses are complex, separate analyses were done for each level of self-esteem. For the subjects of low self-esteem, there was a marginally significant interaction between the favorability of the self-evaluation and whether the items were self-esteem or defensive in nature, $F(1,14) = 4.36$, $p = .056$. Subjects of average self-esteem also exhibited this interaction, $F(1,14) = 5.29$, $p = .037$. However, subjects of high self-esteem did not exhibit this interaction but instead exhibited a main effect for the favorability of self-evaluation, $F(1,10) = 8.16$, $p = .017$.

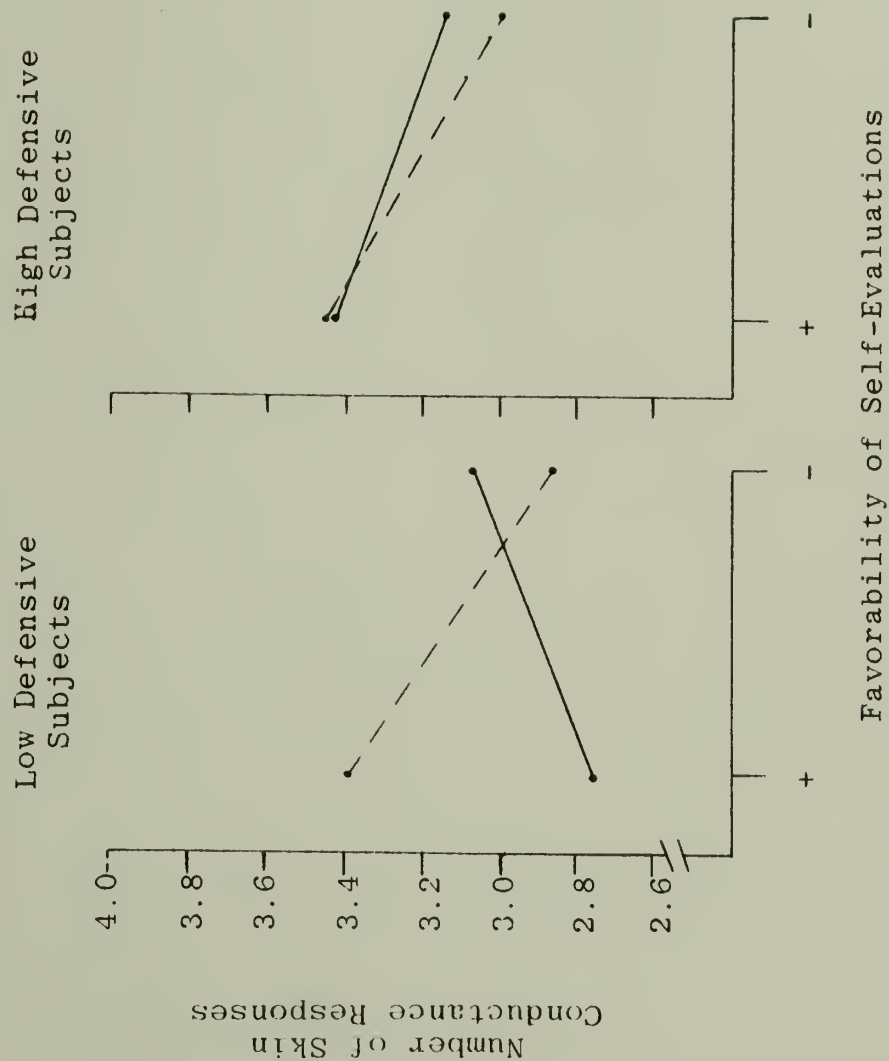


Figure 8. Number of skin conductance responses for subjects grouped by level of defensiveness and data collapsed by the type of items presented and the favorability of self-evaluations.

— = self-esteem items - - - = defensiveness items

This indicates that subjects of high self-esteem tend to react to self-esteem and defensiveness items in a similar manner.

The types of items presented were also analyzed separately. When the defensiveness items were considered, a significant effect was found for the favorability of self-evaluations, $F(1,38) = 7.53$, $p = .009$. This was a trend for all subjects regardless of level of self-esteem or defensiveness. When responding to defensiveness items, favorable self-evaluations were associated with more skin conductance reactions than unfavorable self-evaluations.

When the number of skin conductance responses to the self-esteem items were analyzed, significant interactions were found between the favorability of self-evaluations and level of self-esteem, $F(2,39) = 4.18$, $p = .023$, and also between the favorability of self-evaluations and level of defensiveness, $F(1,39) = 6.86$, $p = .012$. These findings indicate that subjects of high self-esteem or of high defensiveness reacted to self-esteem items in a defensive manner.

Summary of analysis by the type of response. The measures of response latency and number of skin conductance responses showed similar effects, although the latter appears to be more sensitive in this situation. The general findings were that both of these measures were greater when subjects reported unfavorable than favorable self-evaluations in

response to the self-esteem items. In contrast, both measures were greater when subjects reported favorable than unfavorable self-evaluations in response to defensiveness items.

The grouping of subjects by level of self-esteem and level of defensiveness had similar effects on the frequency of skin conductance responses specific to the self-esteem items. Subjects of average and low self-esteem tended to react more during unfavorable self-evaluations than favorable self-evaluations. Subjects high on the scales of self-esteem or defensiveness tended to produce relatively many skin conductance responses during favorable than unfavorable self-evaluations in response to self-esteem items.

CHAPTER IV

DISCUSSION

The purpose of this experiment was to study the reactions of people with differing levels of self-esteem and defensiveness in a situation of a demand for self-disclosure via questionnaire. In order to infer emotional reactions, several measures of psychophysiological response were taken. The results indicate that only the skin conductance and latency measures were reliable indicators of stress. For the purposes of this study, heartrate, eyeblink rate, and squinting were unreliable, invalid, or insensitive measures.

A probable explanation of the lack of findings concerning heartrate is that, although psychological stress could be detected, it was not as physiologically arousing as a physical threat or the arousal states induced during normal lie detection procedures. Perhaps the minimal physical activity involved also reduced the degree of heartrate reactions.

In this study, the experimenter tried to minimize the stress of the testing situation, although some stress was certainly induced. The rating of personality-test items was not a novel experience for the subjects, and, as with

paper and pencil tests, there was little personal interaction between tester and testee. Those conditions which reduced stress may have lowered physiological arousal to levels below which heartrate is a reliable indicator.

Palmar skin conductance response seems to be a valid measure of stress during this self-disclosing situation. Skin conductance was significantly affected by the types of items presented and the grouping of subjects by level of self-esteem and defensiveness. A reliable effect over the entire experiment was that the low self-esteem subjects had the highest skin conductance, the high self-esteem subjects had the next highest skin conductance, and the average self-esteem subjects had lower skin conductance than either of the extreme groups.

If skin conductance level can be interpreted as psychological stress, this pattern is explainable in terms of the different significance of the testing situation for each group. Low self-esteem subjects were in a situation which compelled them to report many unfavorable self-concepts. This unpleasant task was predictably stressful. Average self-esteem subjects had the lowest skin conductance. These are people who disclosed both favorable and unfavorable self-concepts, with the tendency toward favorability. This group is typical of most students. Although this study was presumably somewhat stressful for

them, they were far less stressed than the high self-esteem group, judging from their average skin conductance level. High self-esteem subjects exhibited relatively high skin conductance levels although this was a situation in which they could report largely favorable self-evaluations. As will be explained, this seems largely due to a defensive attitude concerning self-disclosure.

When the data were analyzed by the type of items presented, response latency and reading duration were found to be longer for the defensiveness items than for the self-esteem items. This effect was attributed to the number of words presented rather than to more psychological factors. The finding that people took longer to respond to unfavorable items than to favorable items could not be attributed to item length. The subjects also produced more skin conductance response to unfavorable than to favorable items. Because both response latency and skin conductance responses were greater for unfavorable than for favorable items, unfavorable personality items may be considered relatively stressing.

When subjects were grouped by level of self-esteem and level of defensiveness, there were reliable group differences between the types of items presented and the number and magnitude of skin conductance responses. The most striking finding was that, although unfavorable

items were in general more stressful than favorable items, this pattern was reversed for two groups. The high self-esteem, high defensive group and the low self-esteem, low defensive group both exhibited relatively intense reactions to the favorable defensiveness items, although the ratings of agreement made by these two groups were much different.

When the data were analyzed by the type of responses made by the subjects, several interesting effects were found. When this study was proposed, it was hypothesized that measurable stress would be detected during expressions of unfavorable self-esteem and during defensive responses. Both of these hypotheses were supported by the results. Subjects were quicker to express favorable than unfavorable self-evaluations in response to self-esteem items, but were quicker to express unfavorable than favorable self-evaluations in response to defensiveness items. The measure of number of skin conductance responses produced a similar interactive pattern. For most subjects, unfavorable self-evaluations were associated with more skin conductance responses than favorable self-evaluations in response to the self-esteem items. Reactions to the defensiveness items exhibited an opposite pattern, as all groups of subjects produced more skin conductance responses to favorable than to unfavorable self-evaluations in response to the defen-

siveness items.

The patterns for response latency and (for most subjects) the number of skin conductance responses were similar, and both can be attributed to the stress of unfavorable self-evaluation or to the stress of defensive responses and inferred intra-psychic conflict. The basis for this interpretation is the response pattern to the defensiveness items. These were items selected to indicate a defensive response-bias. If subjects denied common social failings or reported socially desirable yet rare qualities, these responses were considered to be a social facade that misrepresents reality. If so, then stress while reporting favorable self-evaluations in response to defensiveness items is no surprise, because this behavior is probably deceptive.

It is of interest that almost every subject in the study made responses classified as defensive, and that all groups showed more psychophysiological signs of stress while making favorable than unfavorable self-evaluations in response to the defensiveness items. Because a non-defensive response involves admitting common social failings or denying socially desirable but untrue attributes, one might expect stress if only the unfavorable nature of these self-evaluations are considered. Stress was probably induced, but it was reliably less intense than that

induced by defensive responses.

The finding that defensive responses were associated with relatively high levels of stress deserves further discussion. Were subjects being purposefully deceptive? This question can be approached by considering the items presented. Half of the items concern widespread but "bad" feelings of hostility toward others, such as "I have sometimes felt resentful about not getting my way." The other items include claims of willingness to admit faults and claims of total honesty, such as "I always practice what I preach." The assumption made during the construction of this and similar scales is that all people actually do have occasional feelings of hostility, that all people prefer to hide faults, and that all people have bent the truth at times. People unwilling to admit these common faults are presumed to be defensive.

An alternate hypothesis is that people may be telling the truth about themselves and are simply well-socialized. From this perspective, responses classified as defensive could be nothing but the product of a cynical view of people. However, this is countered by the finding of relatively high stress during defensive responses as compared to non-defensive responses, especially when we consider that non-defensive responses were unfavorable self-evaluations. Thus, the pattern of response to the defen-

siveness items does seem to indicate that skin conductance responses are induced by defensive misrepresentation.

The majority of subjects produced more skin conductance responses during unfavorable than favorable self-evaluation in response to the self-esteem items. In contrast, subjects with high defensiveness scores and subjects with very high self-esteem scores, produced larger responses during favorable than unfavorable self-evaluation in response to the self-esteem items, a pattern similar to that found for the defensive items. The conclusion from this seems to be that for the high self-esteem subjects, these responses concerning general self-esteem were also defensive in nature. By this reasoning, misrepresentation of high self-esteem was associated with signs of stress because, at some level, the high self-esteem subjects experienced intrapsychic conflict.

This experiment thus supports the hypothesis that high self-esteem scores are often a defensive facade. The reported self-evaluations presented by the high self-esteem subjects seem to be countered by an implicit self-evaluation manifested emotionally. To subjects high on scales of self-esteem or defensiveness, unfavorable items were relatively distressing although denied. This suggests that at some level such items are seen as congruent with a suppressed self-evaluation, and there is intrapsychic conflict.

These results do not necessarily indicate that the high self-esteem subjects were consciously deceptive. As Wylie (1974) has pointed out, a socially desirable response-bias does not in itself invalidate the self-report as an indicant of the phenomenal self. Subjects reporting high self-esteem may consciously believe the facade they have developed to be true. The stress induced during such misrepresentation may be perceived phenomenologically as undifferentiated anxiety, with the person unwilling or unable to criticize the self even in private. Cohen (1959) characterizes persons with very high self-esteem scores as employing a self-protective facade and as using repression and denial to maintain a cohesive self-picture. A similar view is expressed by Crowne and Marlowe (1964) when they address the question of whether their scale is one of conscious and deliberate faking or of a less conscious defensive kind of self-depiction. They conclude that the data are not definitive in this respect, but does tend to support the latter interpretation.

Although this experiment was not designed to discriminate other-deception from self-deception, the results suggest that self-deception was the probable process. In this study, subjects were told that their responses would be confidential. Employment, group-esteem, or the favor of persons significant in their lives were not at stake.

Thus, misrepresentation could be motivated by a desire to look good to the experimenter or by a desire to look good to oneself. The experimental procedures of having the subjects disclose themselves in a separate room, and the non-judgemental and relatively impersonal attitude of the experimenter were expected to minimize concern on the part of subjects regarding how they were evaluated by the experimenter. These conditions support the conclusion that the responses made by subjects were indicative of internal needs rather than external demands. Thus the stress induced by this study probably had less to do with the social situation than the self-evaluative situation. In this perspective, reporting unfavorable self-evaluations was found to be stressing to the self-system itself, and misrepresentation was probably motivated not so much by other-deception as self-deception.

If this study has found effects which can be attributed to self-deception in subjects high on the defensiveness scale and very high on the self-esteem scale, the question arises as to whether this can be interpreted as evidence for an unconscious process. In this study the high self-esteem subjects reported favorable self-evaluations yet showed signs of stress. Stress was also exhibited by most subjects during responses defined as deceptive.

This stress may have been caused by intrapsychic conflict as described by Freud (1923). He wrote that part of the superego may become repressed and guilt may become unconscious, as in hysterical neurosis. Perceptions which are consistent with the repressed concepts would motivate its expression, which would in turn produce anxiety and defensive repression. This explanation describes the findings of stress during defensive responses for subjects in general, and the findings of stress during favorable self-evaluation by the high defensive or very high self-esteem subjects.

It should be noted that the high self-esteem group in this study was a more extreme group than in most other studies. Instead of selecting subjects on the basis of a median-split, the average scores for the extreme groups are representative of the upper and lower 20% of the distribution of self-esteem scores. Thus the conclusion should not be reached that high self-esteem subjects in general use concealing defenses to maintain a favorable facade. This study found such defenses to be characteristic only of very high self-esteem subjects.

It is also noteworthy that the Crowne and Marlowe scale was not able to discriminate defensive from nondefensive very high self-esteem subjects. Both groups of very high self-esteem subjects produced more skin conductance

responses to favorable than unfavorable self-evaluations in response to self-esteem items. This effect was somewhat stronger for the subjects of high defensiveness, but the group differences were not significant. Thus, very high self-esteem subjects, regardless of defensiveness scores, tend to produce responses indicative of stressful misrepresentation while reporting high self-esteem. It may be that the defensiveness items are overly obvious, and that one factor in low defensive scores is a discrimination between self-esteem and defensiveness items in terms of testability and plausability. High self-esteem low defensive subjects may be more 'test-wise'.

In summary, one can conclude that personality inventories are not stress-free, but rather put people in a conflict between unfavorable self-disclosure and defensive misrepresentation. Both of these behaviors produce psychological stress, which can be detected using response latency and skin conductance measures. Thus these findings support psychoanalytic and phenomenological theory, which both describe the process of self-disclosure in terms of conflict between a need for self-esteem enhancement and a need to maintain a consistent and valid self-theory.

REFERENCES

- Adler, A. Study of organ inferiority and its psychical compensation. New York: Nervous and Mental Diseases Publishing Co., 1917.
- Alexander, R.B. Psychophysiological reactions to favorable and unfavorable self-evaluations. Unpublished study, 1977.
- _____. Arousal during questionnaire self-presentation. Unpublished study, 1975.
- Averill, J.R. and Opton, E.M., Jr. Psychophysiological assessment: rational and problems in Advances in Psychological Assessment, Vol. 1, Palo Alto, California: Science and Behavior Books, 1968.
- Byrne, D. The repression sensitization scale: rational, reliability, and validity. Journal of Personality, 1961, 29, 334-349.
- Cannon, W.B. Bodily changes in pain, hunger, fear and rage. (2nd ed.). New York: Appleton-Century, 1929.
- Chapman, A.J. An electromyographic study of apprehension about evaluation. Psychological Reports, 1973, 33, 811-814.
- Cohen, A.R. Some implications of self-esteem for social influence. In Hovland, C.I. and Janis, I.L., eds. Personality and Persuasibility, Volume II. New Haven, Conn.: Yale University Press, 1959.
- Combs, A.W. and Snygg, D. Individual Behavior: A perceptual approach to behavior. New York: Harper and Brothers, Inc., 1959.
- Cronbach, L.J. Coefficient alpha and the internal structure of tests. Psychometrika, 1951, 16, 297-334.
- Crowne, D.P. and Marlowe, D. A new scale of social desirability independent of psychopathology. Journal of Consulting Psychology, 1960, 24, 349-354.

- Crowne, D.P. and Marlowe, D. The approval motive: Studies in evaluative dependence. New York: Wiley, 1964.
- Crowne, D.P. and Strickland, B.R. The conditioning of verbal behavior as a function of the need for social approval. Journal of Abnormal Social Psychology, 1961, 63, 395-401.
- Dixon, W.J. (ed.). Biomedical Computer Programs. Berkeley: University of California Press, 1975.
- Edwards, A.L. The social desirability variable in personality assessment and research. New York: Dryden, 1957.
- Edwards, A.L. and Walker, J.N. A short form of the MMPI: the S.D. scale. Psychological Reports, 1961, 8, 485-486.
- Epstein, S. The self concept revisited or a theory of a theory. American Psychologist, 1973, 28, 404-416.
- _____. Anxiety, arousal, and the self-concept. In Sarason, I.G. and Spielberger, C.D. (eds.), Stress and Anxiety, Vol. 3. Washington, D.C.: Hemisphere Pub. Co., 1976, 185-224.
- Epstein, S. and Fenz, W.D. The detection of areas of emotional stress through variations in perceptual threshold and physiological arousal. Journal of Experimental Research in Personality, 1967, 2, 191-199.
- Fenz, W.D. and Epstein, S. Gradients of physiological arousal in parachutists as a function of an approaching jump. Psychosomatic Medicine, 1967, 29, 33-51.
- Flanagan, J. Galvanic skin response: emotion or attention? Proceedings, 75th Annual Convention, A.P.A., 1967.
- Freud, S. The Ego and the Id. Translated by Joan Riviere, revised and edited by J. Strachey. New York: Norton, 1960. (First German edition, 1923.)
- _____. Inhibitions, symptoms and anxiety. In Standard Edition, Vol. 20. London: Hogarth Press, 1959. (First German edition, 1926.)

- Ghei, S.N. A cross-cultural comparison of the social desirability variable. Journal of Cross-Cultural Psychology, 1973, 4, 493-500.
- Greenwalf, A.G. and Ronis, D.C. Twenty years of cognitive dissonance: Case study of the evolution of a theory. Psychological Review, 1978, 85, (1), 53-57.
- Haney, J.N. and Euse, F.J. Skin conductance and heartrate responses to neutral, positive, and negative imagery: Implication for covert behavior therapy procedures. Behavior Therapy, 1976, 7, 494-503.
- Hathaway, S.R. and McKinley, J.C. The Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943.
- Horney, K. The Neurotic Personality of our Time. New York: Norton, 1937.
- James, W. Psychology: The Briefer Course, 1892. Excerpts found in Gordon, C. and Gergon, K.J., The Self in Social Integration. New York: John Wiley and Sons, Inc., 1968.
- Johnson, P. Birth order and Crowne-Marlowe social desirability scores. Psychological Reports, 1973, 32, 536.
- Jung, C.G. and Riklin, F. Diagnostische assoziation studien: I. Experimentelle untersuchungen uber assoziationen gesunder. Journal of Psychological Neurology, 1904, 3, 193-215.
- Kelly, G. The Psychology of Personal Constructs, 1955.
- Kuno, Y. Human Perspiration. Springfield, Illinois: Charles C. Thomas, 1956.
- Larson, J.A. Lying and its detection: a study of deception and deception tests, 1932. Reprinted 1969, Publication No. 78: Patterson Smith Reprint series in Criminology, Law Enforcement, and Social Problems, Montclair, N.J.
- Lecky, P. Self-consistency: A theory of personality. New York: Island Publ, 1945.
- _____. Self-consistency: A theory of personality. New York: Doubleday, 1969.

- Luria, A.R. The nature of human conflicts, or, emotion, conflict and will. Translated from Russian and edited by W. Horsley Gantt. New York: Liveright Publishers, 1932.
- Marston, W.M. Reaction time symptoms of deception. Journal of Experimental Psychology, 1920, 3, 72-87.
- Murray, H.A. Explorations in personality. New York: Oxford University Press, 1938.
- Nie, N.H.; Hull, C.H.; Jenkins, J.G.; Steinbrenner, K. and Bent, D.H. Statistical Programs for the Social Sciences, second edition. New York: McGraw-Hill, 1975.
- Opton, E.M., Jr. and Lazarus, R.S. Personality determinants of psychophysiological responses to stress: A theoretical analysis and an experiment. The Journal of Personality and Social Psychology, 1967, 6, 291-303.
- Pavlov, I.P. Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex. Translated by Anrep, G.V., Oxford University Press, 1927.
- Raskin, D.C. Psychopathy and detection of deception in a prison population. A paper presented at the Annual Meeting of the Society of Psychophysiology, 1975.
- Rogers, C. Client-centered Therapy. New York: Houghton Mifflin, 1951.
- . A theory of therapy, personality and interpersonal relationships as developed in the client-centered framework. In S. Koch (ed.), Psychology: A Study of Science, Vol. 3. New York: McGraw-Hill, 1959.
- Schachter, S. and Singer, J.E. Cognitive, social and physiological determinants of emotional state. Psychological Review, 1962, 69, 5, 379-399.
- Schneider, D.J. and Turkat, D. Self-presentation following success or failure: Defensive self-esteem models, Journal of Personality, 1975, 43, 127-135.

- Sohlberg, S. Social desirability responding in Jewish and Arab children in Israel. Journal of Cross-Cultural Psychology, 1976, 7, 301-314.
- Strickland, B. and Crowne, D.P. Need for approval and the premature termination of psychotherapy. Journal of Consulting Psychology, 1963, 27, 95-101.
- Weinstein, J.; Averill, J.R.; Opton, E.M., Jr.; and Lazarus, R.S. Defensive style and discrepancy between self-report and physiological indexes of stress. J. of Pers. and Soc. Psych., 1968, 10, 4, 406-413.
- Wicklund, R.A. and Brehm, J.W. Perspectives in Cognitive Dissonance. New York: John Wiley and Sons, 1976.
- Wylie, R.C. The Self-Concept: A Critical Survey of Pertinent Research Literature. University of Nebraska Press, 1961.
- _____. The Self Concept, Volume 1: A Review of Methodological Considerations and Measuring Instruments. University of Nebraska Press, 1974.

APPENDIX A

The O'Brien and Epstein Self-Esteem Inventory

General self-esteem

GEN SE+

- 22. All in all, I'm quite satisfied with whom I am
 - 53. In general, I have a high opinion of myself.
 - 63. I like myself.
 - 68. I feel that I am a person of worth.
 - 83. I feel good about myself, who I am and what I'm like.
-

GEN SE-

- 10. I am a great big nobody.
 - 31. I have little respect for myself.
 - 41. I have a low opinion of myself.
 - 89. I sometimes wish I were someone else.
 - 93. If I were really to be myself, people wouldn't think well of me.
-

Power Over Self (self-control)

POS+

- 3. My emotions rarely get out of hand.
 - 51. Self-control is no problem for me.
 - 58. I have at least as much self-control as most people.
 - 86. Controlling my emotions is not a problem for me.
 - 91. I have a lot of will power.
-

POS-

- 18. I am bothered by my lack of self-control.
 - 64. My inability to resist temptation is a source of concern for me.
 - 66. I sometimes worry about losing control of myself.
 - 72. I am lacking in will power.
 - 82. Self-discipline is a problem for me.
-

The O'Brien and Epstein Self-Esteem Inventory

Power over others

POO+

- 11. I am not easily dominated by others.
 - 39. I do not let people push me around.
 - 43. I am an independent person.
 - 77. Others often follow my lead.
 - 98. I tend to have a strong influence on people.
-

POO-

- 35. I give in to others too easily.
- 46. I'm not good at influencing people.
- 59. I am not very good at getting people to do as I wish.
- 62. I let too many people take advantage of me.
- 79. I am often afraid to say what I think.

Likability

LIK+

- 23. I have (or am confident that someday I will have) a close, warm relationship with someone who understands me.
 - 60. Most people like me.
 - 70. I'm an easy person to like.
 - 78. There are people who love me very much.
 - 96. People like being with me.
-

LIK-

- 15. I sometimes doubt that anyone who really mattered to me could love me the way I am.
 - 19. No one loves or cares about me.
 - 29. I tend to assume that people will not like me.
 - 50. I am very sensitive to disapproval.
 - 73. I'm not a very likable person.
-

The O'Brien and Epstein Self-Esteem Inventory

Competence

COMP+

1. I am quick to learn new things.
 7. I can handle almost any important problem I am faced with.
 17. I am a capable person.
 42. When I put my mind to something, I almost always succeed.
 95. I succeed at most things I attempt.
-

COMP-

5. I have an inferiority complex.
 26. I feel as if nothing I do is very good.
 45. There are very few things that I can honestly say I am good at.
 57. I am not a capable person.
 74. I often feel incompetent or inadequate.
-

Morality

M+

13. I regard myself as a highly ethical person.
 67. I have a firm sense of what is right and wrong, and act accordingly.
 85. I regard myself as basically a good and decent person.
 92. I am pleased with my sense of values.
 99. I have a firm set of values.
-

M-

34. I frequently do things that I later feel guilty about.
 38. My values need straightening out.
 47. I lack firm guiding principles.
 54. I am not a nice person.
 90. I do not have a clear sense of values.
-

The O'Brien and Epstein Self-Esteem Inventory

Body ImageBI+ (health)

- 2. I have been endowed with a strong and health body.
- 37. In general, I don't have to worry about my health.
- 75. I generally have a sense of physical well-being.

BI- (health)

- 21. I get physically run down easily.
 - 27. I often worry about my physical health.
 - 87. I become ill quite easily.
-

BI+ (functioning)

- 6. I am well coordinated physically.
- 9. I have more physical endurance than most.
- 33. I tend to be good at physical activities, such as dancing or sports.

BI- (functioning)

- 30. I am not a well-coordinated person.
 - 55. I often feel worn out for no apparent reason.
 - 71. I tend to be awkward in most physical activities.
-

BI+ (appearance)

- 25. I like the way I look.
- 49. I feel that I am a physically attractive person.
- 81. I think I am at least as good looking as most people.

BI- (appearance)

- 14. I do not like the way I look.
 - 94. I often feel unattractive.
 - 97. I am ashamed of my physical appearance.
-

The O'Brien and Epstein Self-Esteem Inventory

Defensiveness ScaleDS+

- 4. I have always been courteous, even to people who have been disagreeable to me.
 - 8. I have never minded admitting that I don't know something.
 - 20. I have never felt that I was punished without cause.
 - 24. I have never been irked when people expressed ideas very different from my own.
 - 32. I have never felt like saying something that would hurt someone's feelings.
 - 40. My table manners at home are as good as when I eat out in a restaurant.
 - 44. No matter who I'm talking to, I'm always a good listener.
 - 56. I have almost never felt the urge to tell someone off.
 - 80. I always practice what I preach.
 - 84. I'm always willing to admit it when I make a mistake.
-

DS-

- 12. I sometimes say things that are not completely true.
 - 16. I have gossiped at times.
 - 36. At elections I have sometimes voted for people about whom I know very little.
 - 48. There have been times when I have intensely disliked someone.
 - 52. I would rather win than lose in a game.
 - 61. There have been times when I was quite jealous of the good fortune of others.
 - 65. I have sometimes felt resentful about not getting my way.
 - 69. I have sometimes felt like getting even, rather than forgiving and forgetting.
 - 76. I have sometimes been irritated by people asking favors of me.
 - 88. There have been occasions when I took advantage of someone.
-

The O'Brien and Epstein Self-Esteem Inventory

Item Pairs for Internal Consistency

- 3. My emotions rarely get out of hand.
- 86. Controlling my emotions is not a problem for me.
- 6. I am well coordinated physically.
- 33. I tend to be good at physical activities, such as dancing or sports.
- 14. I do not like the way I look.
- 94. I often feel unattractive.
- 25. I like the way I look.
- 49. I feel that I am a physically attractive person.
- 26. I feel as if nothing I do is very good.
- 74. I often feel incompetent or inadequate.
- 31. I have little respect for myself.
- 41. I have a low opinion of myself.
- 38. My values need straightening out.
- 90. I do not have a clear sense of values.
- 46. I'm not good at influencing people.
- 59. I am not very good at getting people to do as I wish.
- 51. Self-control is no problem for me.
- 58. I have at least as much self-control as most people.
- 53. In general, I have a high opinion of myself.
- 83. I feel good about myself, who I am and what I'm like.
- 60. Most people like me.
- 70. I'm an easy person to like.

Total self-esteem score

The sum of ratings to the favorable self-esteem items minus the sum of ratings to the unfavorable self-esteem items.

APPENDIX B

The Marlowe-Crowne Social Desirability Scale

Personal Reaction Inventory

Listed below are a number of statements concerning attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you personally.

1. Before voting I thoroughly investigate the qualifications of all the candidates. (T)
2. I never hesitate to go out of my way to help someone in trouble. (T)
3. It is sometimes hard for me to go on with my work if I am not encouraged. (F)
4. I have never intensely disliked anyone. (T)
5. On occasion I have had doubts about my ability to succeed in life. (F)
6. I sometimes feel resentful when I don't get my way. (F)
7. I am always careful about my manner of dress. (T)
8. My table manners at home are as good as when I eat out in a restaurant. (T)
9. If I could get into a movie without paying and be sure I was not seen I would probably do it. (F)
10. On a few occasions, I have given up doing something because I thought too little of my ability. (F)
11. I like to gossip at times. (F)
12. There have been times when I felt like rebelling against people in authority even though I knew they were right. (F)
13. No matter who I'm talking to, I'm always a good listener. (T)
14. I can remember "playing sick" to get out of something. (F)
15. There have been occasions when I took advantage of someone. (T)
16. I'm always willing to admit it when I make a mistake. (T)
17. I always try to practice what I preach. (T)

The Marlowe-Crowne Social Desirability Scale

18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people. (T)
19. I sometimes try to get even rather than forgive and forget. (F)
20. When I don't know something I don't at all mind admitting it. (T)
21. I am always courteous, even to people who are disagreeable. (T)
22. At times I have really insisted on having things my own way. (F)
23. There have been occasions when I felt like smashing things. (F)
24. I would never think of letting someone else be punished for my wrongdoings. (T)
25. I never resent being asked to return a favor. (T)
26. I have never been irked when people expressed ideas very different from my own. (T)
27. I never make a long trip without checking the safety of my car. (T)
28. There have been times when I was quite jealous of the good fortune of others. (F)
29. I have almost never felt the urge to tell someone off. (T)
30. I am sometimes irritated by people who ask favors of me. (F)
31. I have never felt that I was punished without cause. (T)
32. I sometimes think when people have a misfortune they only got what they deserved. (F)
33. I have never deliberately said something that hurt someone's feelings. (T)

APPENDIX C

Self-Esteem and Defensiveness Items Presented During Intensive Testing

- | SE | D | |
|----|---|--|
| - | | 1. I give in to others too easily. |
| + | | 2. I have never been irked when people expressed ideas very different from my own. |
| + | | 3. I always practice what I preach. |
| - | | 4. I sometimes feel incompetent or inadequate. |
| + | | 5. I am a physically attractive person. |
| - | | 6. I have sometimes felt resentful about not getting my way. |
| + | | 7. Self-control is no problem for me. |
| - | | 8. I have an inferiority complex. |
| - | | 9. I have sometimes been irritated by people asking favors of me. |
| - | | 10. I sometimes feel ashamed of my physical appearance. |
| - | | 11. I have sometimes felt like getting even, rather than forgiving and forgetting. |
| - | | 12. I am often afraid to say what I think. |
| - | | 13. There have been occasions when I took advantage of someone. |
| + | | 14. I have never felt like saying something that would hurt someone's feelings. |
| + | | 15. I'm always willing to admit it when I make a mistake. |
| + | | 16. I have a great deal of self-confidence. |
| + | | 17. I'm quite satisfied with who I am. |

SE D

- + 18. I have never minded admitting that I didn't know something.
 - + 19. I tend to have a strong influence on people.
 - 20. I sometimes say things that are not completely true.
-

SE = self-esteem items

D = defensiveness items

+ = favorable items

- = unfavorable items

